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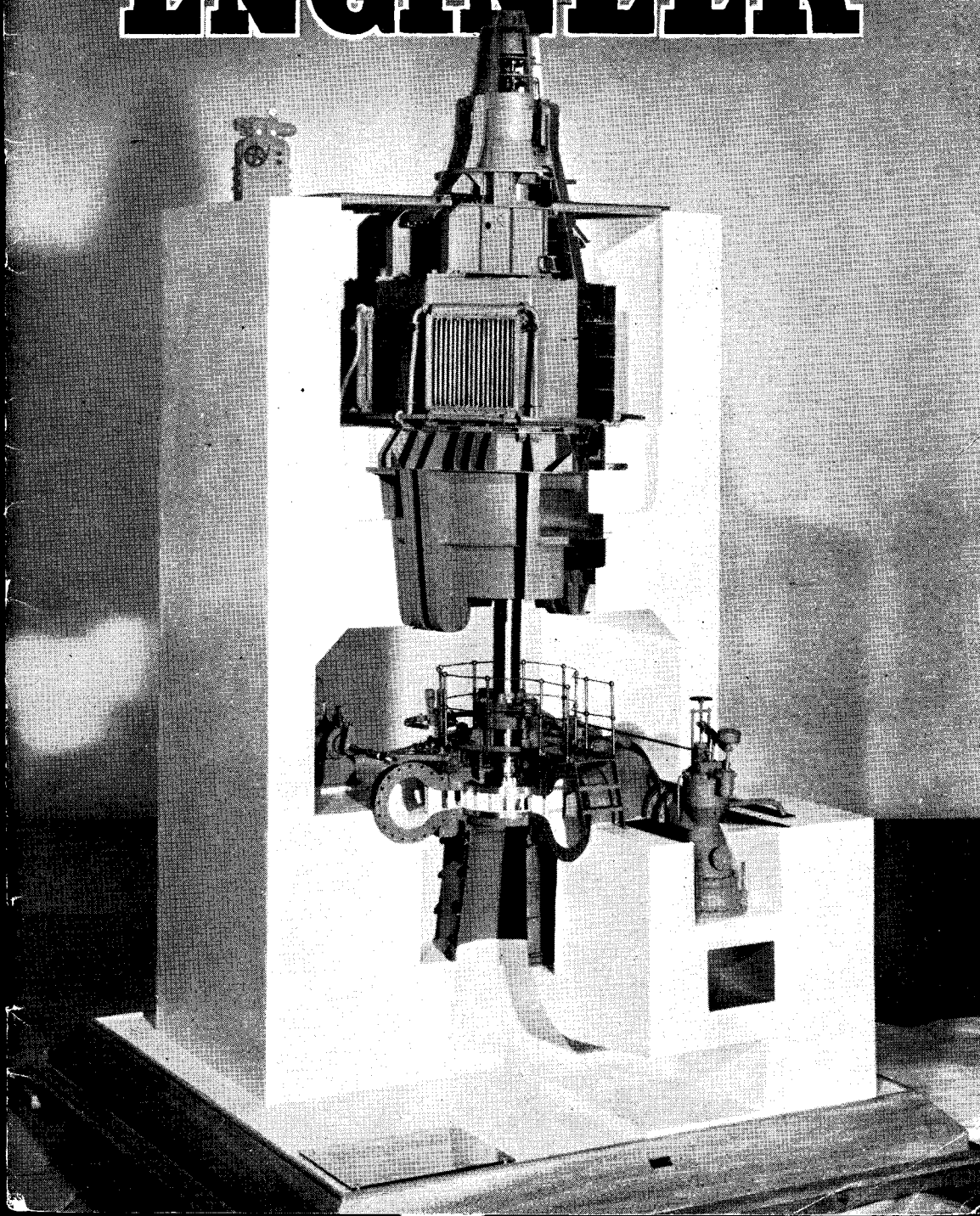
THE MODEL ENGINEER



The MODEL ENGINEER

PERCIVAL MARSHALL & CO. LTD., 23, GREAT QUEEN ST., LONDON, W.C.2

17TH MAY 1951

VOL. 104 NO. 2608

SMOKE RINGS

Our Cover Picture

● AT THE recent exhibition organised by the North of Scotland Hydro-electric Board and held in Dundee, Metropolitan-Vickers Electrical Co. Ltd. had a stand to display an appropriate selection of their products. One of these was in the form of a miniature replica of a 17,100-kVA, 600-r.p.m. water-turbine-driven a.c. generator; the firm has four of the full-size machines under construction for the Kiewa Hydro-electric scheme of the Victoria State Electricity Commission, Australia.

As our cover picture shows, the model is part-sectioned, so that the internal arrangement can be clearly demonstrated; in the picture, the inside of the water-turbine is exposed to view.

We have no information as to the scale to which this interesting model was built, but judging by another photograph we have seen, the entire structure appears to be about 4 ft. 6 in. high.

Thousands and Thousands

● THERE IS much to be said in favour of arranging comprehensive displays of model engineering handicraft in conjunction with other exhibitions, more especially if the latter have a popular appeal to the public. For example, the recently-reported model engineering display at Whangarei, New Zealand, was, as stated in the report, part of an exhibition organised by the local Agricultural and Pastoral Society, and the photographs which we published show that it was a very important part.

We are interested to learn from Mr. J. W. Taylor, chief steward of the model engineering section, that no fewer than 35,000 people paid for admission to the show during its run, and practically all these visited the section.

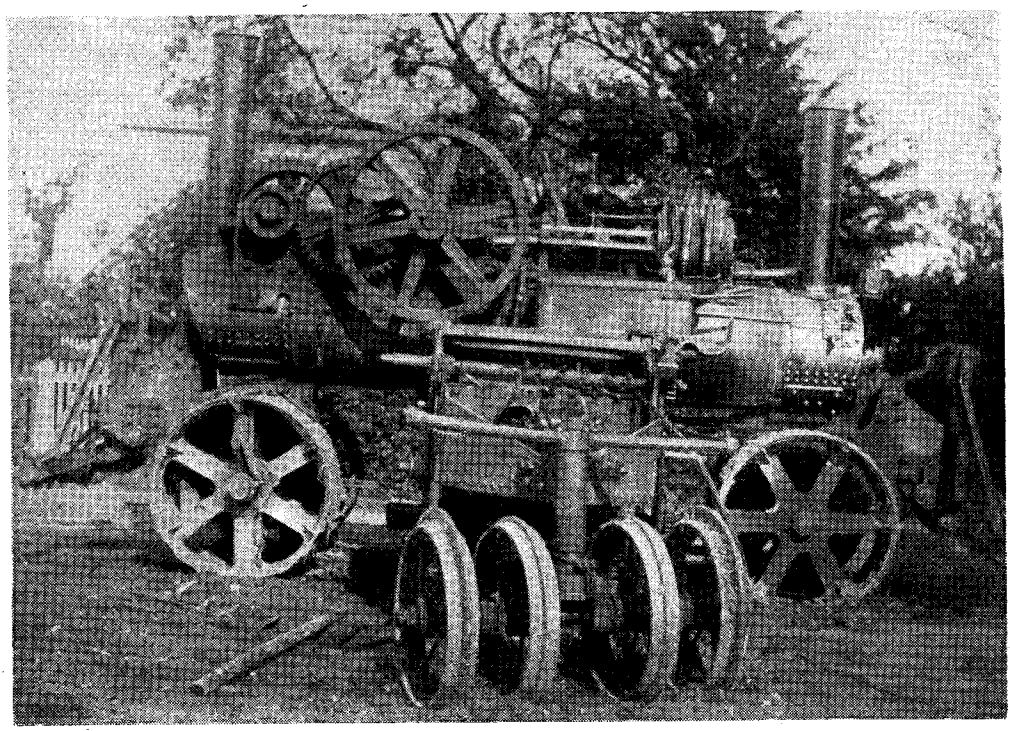
This is, of course, an excellent way of bringing our hobby to the notice of a large section of the public, and can scarcely fail to arouse the interest of many people who may not previously have had even little knowledge of what model engineering really means.

Competitors, Ahoy!

● WE WOULD remind all would-be competitors in the "M.E." Exhibition, 1951, that the dates have been announced, August 22nd to September 1st. As usual, the venue will be the New Horticultural Hall, Greycoat Street, Westminster, S.W.1. Full details and entry forms can be obtained from the Exhibition Manager, Percival Marshall & Co. Ltd., 23, Great Queen Street, London, W.C.2. Applicatns are requested to send an unsealed envelope with a penny stamp attached to it. Entry forms should be filled in and returned not later than Monday, July 16th.

A Curious Old Ploughing Engine ?

● MANY READERS are already well aware that we manage to unearth, from time to time, photographs and descriptions of unusual examples of engineering, large and small ; the photograph reproduced on this page shows another, and has been sent to us by Mr. L. Turney, of Abingdon. Not only is the engine itself distinctly quaint, but the circumstances in which the photograph came to light are strange. Mr. Turney writes :—



" I picked it up by the roadside while out for a cycle ride ; it had a name and date on the back and was in a leatherette folding frame facing a picture of *Victory* (Nelson's ship). The name was Plesbey, the date May 31st, 1891. I think myself it is an old ploughing engine, but why a smoke-stack both ends I do not know. It also looks as though it was fired in the middle."

We confirm the name and date on the back of the print, but we leave it to any reader who can give some details of the engine and—dare we hope ?—discover the owner of the print. Incidentally, Mr. Turney found it on Sunday, November 21st, last.

Drawings of " Britannia "

● OUR ESTEEMED contemporary, *Engineering*, has earned much commendation for having decided to issue some reprints of the splendid drawings, published in a recent number, showing sectional and end elevations, cross-sections and plan of the British Railways' Class 7 4-6-2 engine, *Britannia* and tender. The reprints are in the form of a four-page folder of excellent paper, size 10½ in. by 14¼ in., and the drawings are reproduced to the scale of 10 mm. to 1 ft., though all the more important dimensions are clearly marked.

We think that many of our readers will be glad to take this opportunity of acquiring a copy of a useful and interesting set of drawings ; they can be obtained from : *Engineering*, 35-36, Bedford Street, Strand, London, W.C.2, price 1s.

Novel Conditions

● IN A provincial newspaper we recently noticed an advertisement offering a traction engine for sale ; the engine had once been a showman's engine of well-known make, but was stated to have been " cut down for agricultural purposes." It was " in good condition, with sound firebox and tubes."

Nothing very extraordinary about that, so far ; except, of course, that one seldom sees traction engines advertised today. But reading on, we had a pleasurable surprise, because the advertiser added : " My condition of sale is that this engine must be preserved and not cut up ; also it can be moved by its own power."

We would much like to know if the engine was sold ; if so, who bought it and for how much, but, more than that, whether the purchaser solemnly agreed to respect the " condition of sale."

Close-Range Photography

by W. H. Clarke

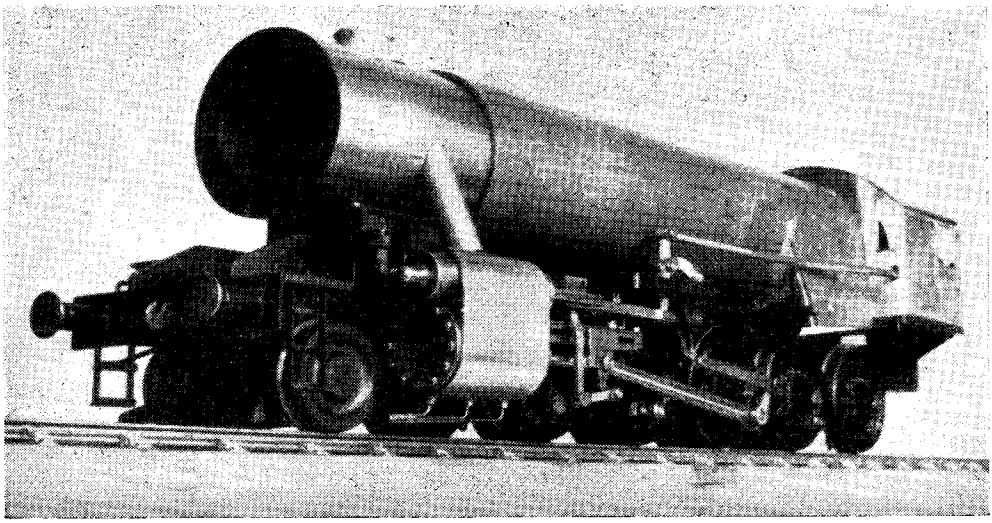
THE recent plaintive cry from a correspondent of this journal wrung my heart, for, until a month ago I was in the same position regarding photographing models and small parts. As a matter of interest, I will tell the tale from the start.

I own a rather dilapidated quarter-plate size roll film folding camera of about 1925 vintage which, over the years, has been used for photographing the family at odd intervals. Last autumn was the last odd interval, four snaps being taken, leaving two to be used. We now move on to this February when a long-absent friend visited me with his home-made super-camera. "Where's the engine," he said, "Let's snap it," which we did. During the process I thought of my own camera with its two unexposed shots, so I said, "In case I don't see you for the next year or so, will you take the remaining two exposures in my Kodak," which we did.

Going up to town the following day with roll film in pocket, I was meditating about the two engine snaps; they would need careful development (doesn't matter about the family shots), leave them at a shop in the city and let them go in the "bag wash"—no fear! It will be gathered from the foregoing that my knowledge of photography was practically nil, but I have learned quite a lot in the course of these experiments. The film was eventually dish-developed by a friend while I looked on and saw the uses made of developing and fixing agents, etc. The engine snaps were well under-exposed, and the engine image—taken at the measured minimum distance of 6 ft.—looked like the proverbial flea on an elephant's back in relation to the size of the negative.

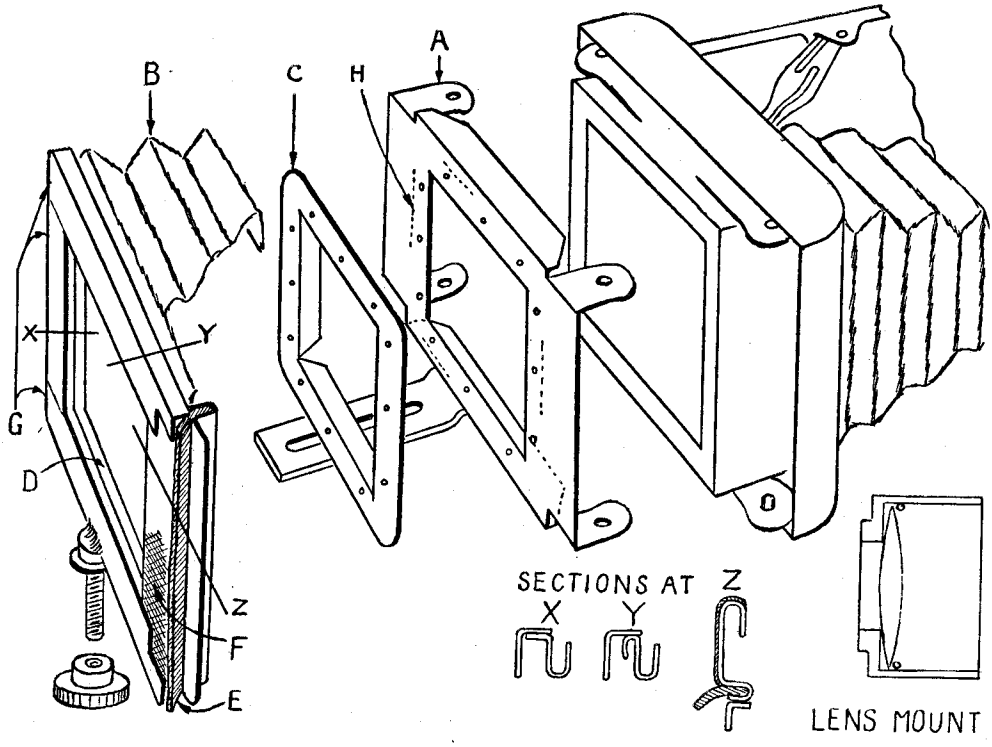
Catastrophic! What to do about it?

The camera was examined and the bellows stop-screw taken off; this allowed a further ½ in. extension. An old quarter-plate, given by another friend, was ground with fine emery powder on one side and held in the film aperture. This was much better, and an image of the engine half the width of the plate was obtained at about 3 ft. distance from the camera—the engine, not the screen. Further experiment gave a full quarter-plate size image with the engine 18 in. from the lens and the ground plate about 1½ in. from the back of the camera. To obtain a clearer idea, the size of the engine would help; it is a gauge "1" 2-10-0, 15 in. long from buffers to cab roof, and is awaiting an injector, the details of which I hope our good friend "L.B.S.C." will soon find time to issue.

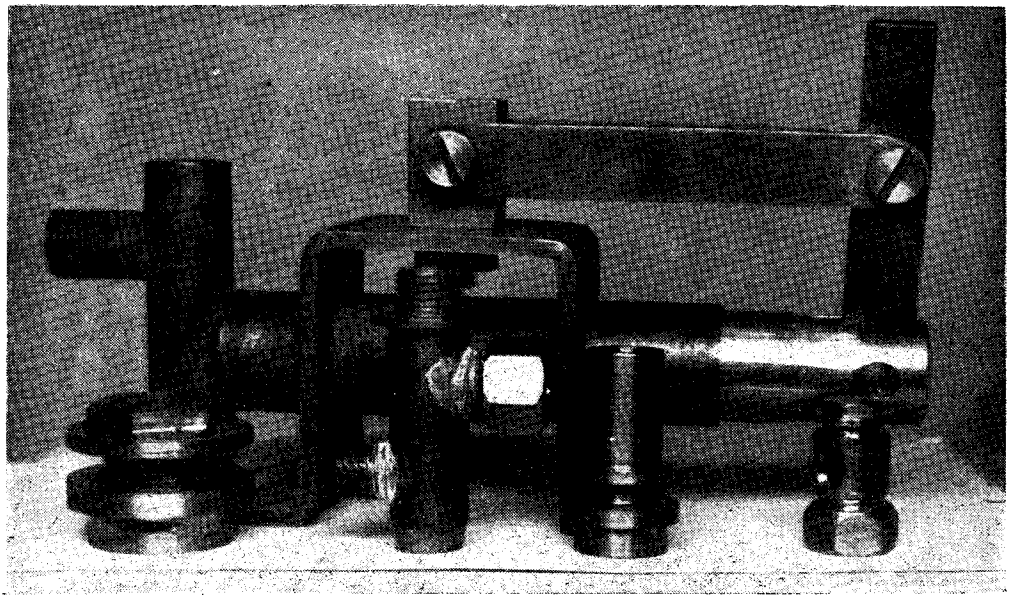


A Gauge "1" Austerity 2-10-0 locomotive at 18 in. from modified camera, without extra lens

Back to the camera; I quite obviously required additional length for focussing and the following modification was therefore made. A piece of 20-gauge tin plate was shaped up to form a backplate (*A*) so that the bends along the sides positioned the plate across the film aperture at the rear of the bellows, a hole being cut in the plate to match the said aperture. The ends of both sides were then bent, marked-out and drilled so that it clipped nicely in place on the



Exploded diagram, showing relative positions of parts making up the clip-on bellows attachment for camera, using 3¼ in. × 4¼ in. plates instead of roll film



Boiler fittings and "L.B.S.C." type water-pump for Austerity locomotive at 7 in. from camera, using additional lens

spigots normally used for holding the roll film, the plate being distanced the thickness of a piece of felt from the back of the camera.

The bellows (*B*) were then taken in hand, a piece of thin black leather skin being obtained from a well-known store. This was marked out and scored with a round-nosed scriber for $\frac{3}{8}$-in. pleats, well wetted in water, the pleats folded and then left overnight to dry under an iron bar with a weight on top.

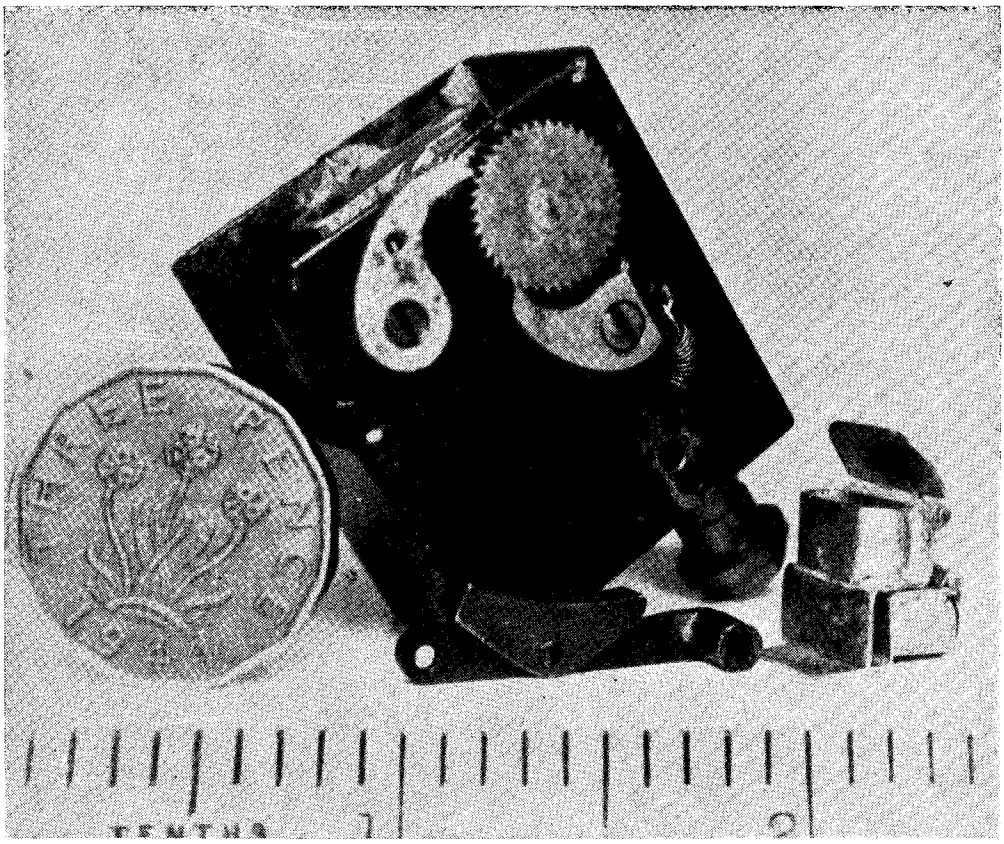
The points where the corners come were then re-wetted, the corner folds inserted, and the embryo bellows again allowed to dry under pressure ; when dry, the edges of the joint were thinned and glued.

A further piece of tinplate (*C*) was cut, $\frac{5}{8}$ in. wider and longer than the aperture of the backplate, the hole being $\frac{1}{2}$ in. less in width and length than the backplate aperture. This plate has the inside edge bent $\frac{1}{4}$ in. at right-angles and is riveted to the backplate with a dozen $\frac{1}{16}$ in. rivets, one end of the bellows being sandwiched between the two plates. The bent-up edges projecting through the backplate aperture form an efficient light trap.

A third piece of tinplate was then shaped up to size as per diagram, to form the dark slide frame (*D*), the inside edges being bent backwards to form a $\frac{5}{16}$ in. deep × 3/32 in. wide trough for the other end of the bellows to sit in, the bellows being secured by three turns of gummed string pressed well down into the slot. The long sides are bent over forwards to form the run for the dark slides. The left-hand short side—with camera on its side and looking at back—is bent forward $\frac{1}{8}$ in. and forms a stop for the dark slide. The right-hand side is bent backwards and then forward forming a groove to carry a strip of felt (*E*) which flaps over the end of the dark slide when the dark slide is in working position. A further light trap (*F*) was found to be necessary and is a strip of fine-haired velvet, obtained from an old cut-throat razor case, glued in place, as in diagram, with a black bituminous plastic. Three strips of tinplate (*G*) were then bent up into right-angles, shaped for the joints and soldered along the sides and left-hand end of the frame with a dark slide in position, thus ensuring light tightness for the dark slide.

The dark slide frame was then soldered to the head of a 2 B.A. screw, as in sketch, a knurled lock-nut being provided. This screw carrying

(*Continued on page 627*)



Scotch crank oil pump, oil cups, brake block and hanger for 2-10-0 *locomotive at* 6 *in. from camera, using additional lens*

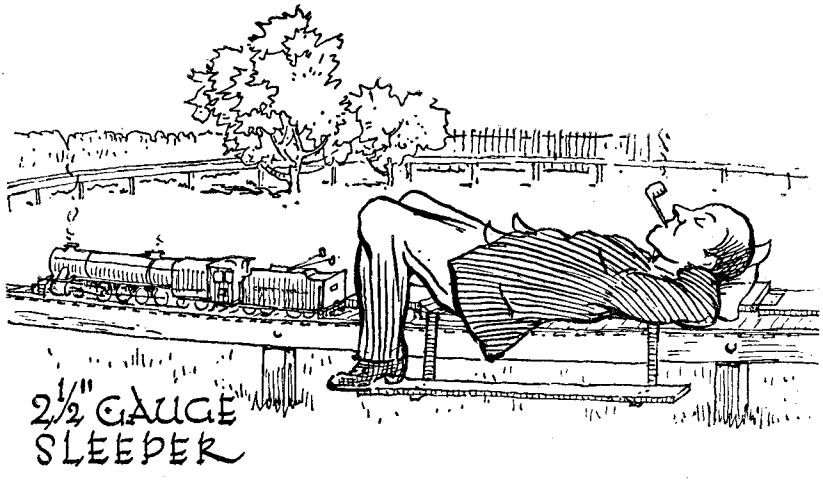
Tales of a Tyro

by Edward Adams

Extracts from the log-book

LEADBETTER, 4-12-2 (after *Caterpillar*, but with 2 cylinders). "November 9th, 1946. First put on rails, moved off with 10-stone Michael, every 20 laps or so was coaled, watered and oiled whilst running. Came lunch-time, a hundred laps, Michael getting tired on hard seat, 11 p.m. using flash-lamp. Family went to bed." What manners!

But the chief interest for me is in the data respecting repairs and adjustments, which by reminding one of past happenings or failures, make for easy detection of current ones. In



persuaded him to complete the next 20 laps, making four miles in the hour."

These long runs are not so much mechanical tests, as trials of physical endurance for the driver. For this reason, I don't see much use for them; once the fact is established that the locomotive will keep on going if properly driven.

Having written the foregoing I dip again into the log-book and immediately contradict myself, for on June 3rd, 1939, I wrote about the engine *Michael*; "Cyclometer on tender shows 23 miles running in one week." I well remember that week's holiday, the best part of it was spent being pulled around the track, with occasional halts and rests reclining on the truck. At least a bucket of coal was consumed and the contents of a butt of soft water. "A strange way to spend a holiday," it was audibly remarked.

The log-book, for so I call it, has been of great interest and value through the years. To be really valuable, it should be faithfully kept, entailing some self discipline, which is amply repaid—like keeping a diary.

Each engine has its data of birth, any outstanding or unusual performances, speeds, loads, mileage, names of drivers and visitors, etc.

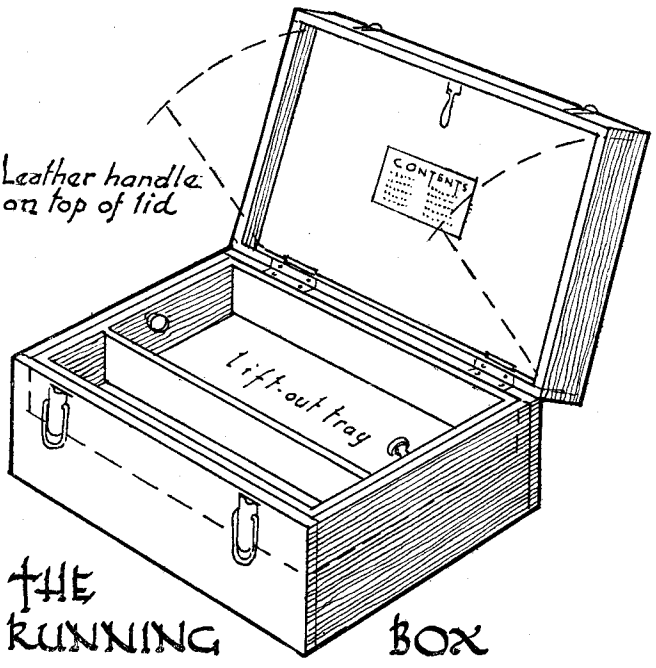
This book also records the behaviour of visiting engines and their owner drivers, such as, "June 4th, 1939, Blank brought his 2-6-0 with coal and water, did 56 laps running until October '45 for instance, air was found to be entering the water supply pipe to injector *via* the gland on tender screwdown cock and stopping work, not an obvious place to look for trouble and easily forgotten.

Another useful accessory is the running box, a converted "surplus" bargain made of stout timber, the size is about 1 ft. 2 in. × 11 in. ×

7 in. deep. In the top half of the box is a lift-out wooden tray, in which we keep the tools and material needed most often, such as small spanners, pliers, blower pricker and cleaning rags, also metal tins containing spare washers for safety-valves, gauge glasses—ready cut to length—rubber gland packings and so on.

Below the tray are cleaning wires—curled up—flue brushes and other tools not so often used. All this makes for convenience and peace of mind in the sometimes hectic steam raising and running.

In the lid is a hinged flap with catch, behind which repose the log-book and other papers, and a chart or table of times per lap, with the corresponding m.p.h., worked out to 10 sec. = 12 m.p.h. to 30 sec. = 4 m.p.h., making it easy to determine speed by a stop watch or less accurately by the second hand of an ordinary watch. Quite often 17 sec. = 7.06 m.p.h. has been registered and 15 sec. = 8 m.p.h. once or twice; but centrifugal pull makes one wary of going faster on our circular track of only 176 ft. circumference—a convenient dimension nevertheless, as 30 laps equal a mile.



Close-Range Photography

(*Continued from page 625*)

the frame works in a slot in a strip of 1¼ in. × $\frac{1}{16}$ in. steel riveted to the bottom of the backplate. This fitting allows of bellows adjustment and a "swing back" for oblique focussing. All metal parts were then painted matt black and four strips of felt (*H*) ¼ in. wide were stuck round the backplate opening.

The next step was to see what results were to be obtained. Not without misgiving, the engine was positioned at one end of the dining room table and the camera at the other with ground glass screen in the place of the dark slide, then kneeling on the floor, I covered my head and the bellows with an old red blazer and focussed up. To check the sharpness of the image, I found it desirable to use a watchmaker's eye-glass and after some manoeuvring for position, a full quarter-plate picture was obtained with the engine about 18 in. from the camera and the bellows—front and back—fairly well extended.

So far, so good, but what about "something 2 in. square." This problem was solved by using a double convex lens, bought while the above work was in progress. The lens is about 8 in. focal length and 1¾ in. diameter and a mount was made for it in ebonite, being a push fit on the existing lens mount, the new lens practically touching the camera lens. The new mount was made 2 in. outside dia. by 1⅝ in. long and forms a lens hood, the new lens being held in place in the hood when wanted by a circular spring wire clip.

The camera was again set up, this time with the objects about 6 in. in front of the additional lens. The image obtained fully covered the ground glass screen, giving a direct magnification on the negative of about one and a half times.

The camera finally took its own photograph by the aid of two mirrors.

This met with my requirements and I thought others might be interested, as there are plenty of roll film cameras that could be modified in a similar manner to take plates, without interfering with the original use or construction of the camera. The cost of the modification was 11s., and worth it for the extra facilities now available. Further improvement would be to make the back bellows a fold or two longer, and to mount the dark slide frame on a ball fixing so as to obtain some correction for vertical lines as well as oblique angles.

I fear the above may appear very elementary to the camera experts, but it may be of use to some brothers of the modelling fraternity, who, on occasion, want to take a big photograph of something small.

How NOT *to Buy a Shaper*

by "Base Circle"

SOME time ago, during the rebuilding of a 3½-in. Drummond lathe, which had been rather badly knocked about while on loan for war work, it was found that some of the filing and scraping required was rather too strenuous to be enjoyable (maybe advancing years have something to do with it) and it was decided that the addition of a shaper of some kind to the workshop equipment was very desirable if not absolutely essential.

Second-hand

A new machine was apparently going to be too expensive so my attention was turned to the advertisements of second-hand machines. As is usually found, machines of all kinds seemed to be very plentiful—except shapers, but eventually an advertisement appeared which seemed worth following up. From the description, the machine appeared to be suitable and as the price was reasonable it was decided to buy it, although it was too far away to be inspected.

In due course the packing case arrived and the shaper was taken out for examination. Well, the description, so far as it went, proved to be truthful—but only just. And the things that were left out of that description! There was no mention, for instance, of the fact that the base supplied, although it may well have been the base of a shaper, was certainly not the base of that particular shaper. Again, although it was admitted that the operating lever was missing, nothing was said about the tool holder and the ram slide gib also being absent.

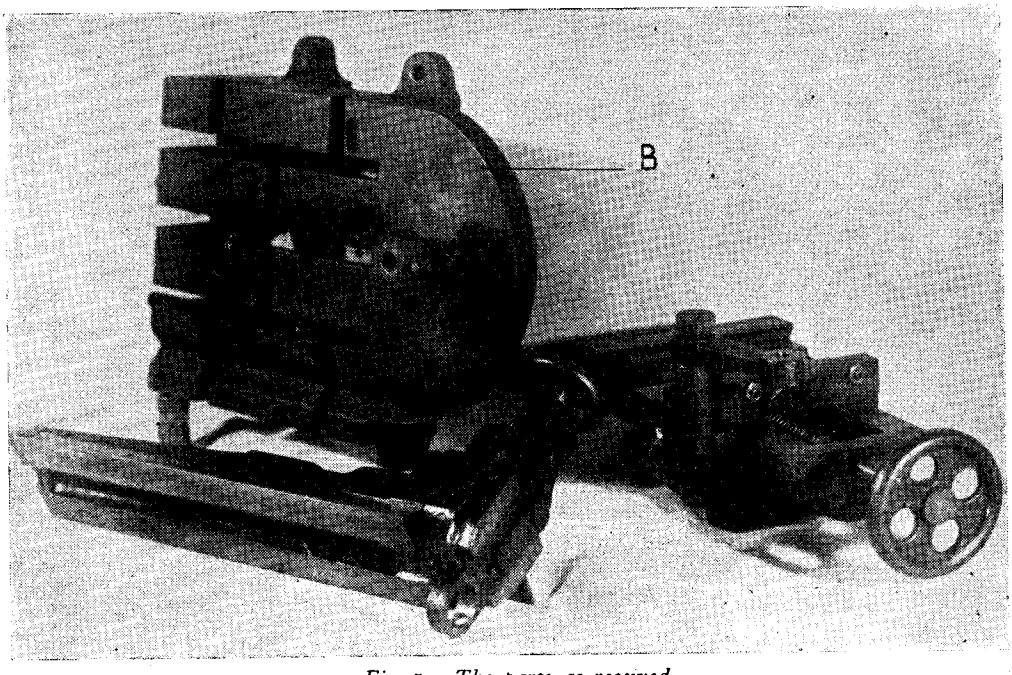


Fig. 1. *The parts as received*

The Bits and Pieces

However, there was nothing to be gained by crying over spilt milk and we set our minds to work to see what could be made of the bits and pieces. The photograph (Fig. 1) shows the machine as delivered. In the foreground will be seen the ram of the usual type carrying the screw-operated tool slide, which adjusts the tool-holder up and down—the actual tool-holder being missing. At the back towards the right is the traverse slide with a total travel of about 8 in. The slide is operated by a ⅝ in. diameter square thread screw. The link to which the operating lever should be coupled will be noted.

Both the ram slide and the cross traverse slide were in a shocking state, and it was immediately apparent that we faced just such another bout of filing and scraping as the shaper had been bought to obviate. The other part of the machine as delivered was the large angle-bracket, *B* (Fig. 1) which, as I have said, did not correspond in any way with the head. There were not even any holes by which the two parts could be bolted together. The biggest difficulty, of course, was that, although the bracket may have been intended to carry an angle type table to give vertical adjustment, no such table was there.

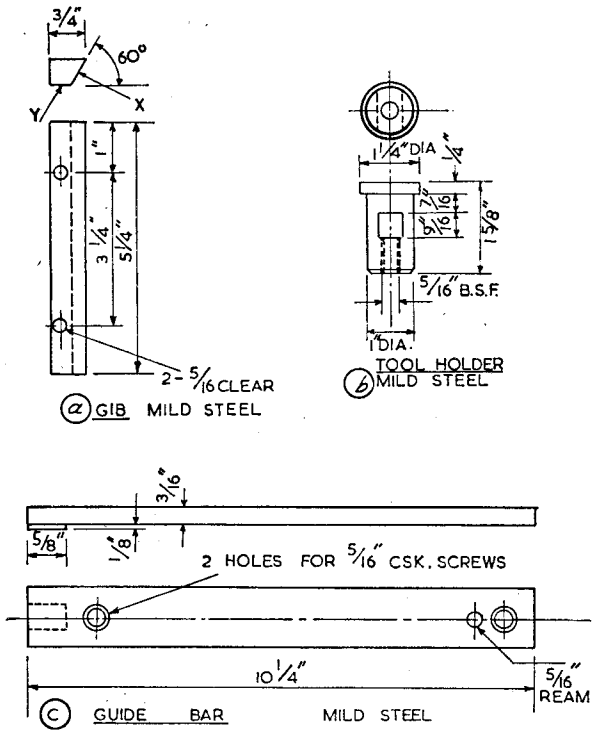


Fig. 2

A Start on the Head

Pending inspiration as to what to do about a table and so on, it was decided to make a start on the head part of the machine. A gib for the ram slide was made with hacksaw, file and scraper, and a great expenditure of energy. The gib is shown at *a* in Fig. 2. It will be seen that the only important point was to get faces *X* and *Y* correct. Face *Y* was first got flat with scraper and surface-plate (in this case a piece of plate glass). By trial and error the other face *X* was gradually filed and scraped to correspond to the angle of the ram. The face *Z* (Fig. 3) of the carriage was next attended to and with the help of a narrow strip of plate glass was eventually made true and straight.

Next the ram was filed and scraped until a good marking was shown over the whole length on both sides. When this stage was reached the gib was finally tightened down and our attention was turned to the traverse slide. The procedure here was the same except that the gib was already provided and our labours were lightened to that extent.

One Good Point!

Eventually, this slide too was passed as O.K. There was at least one good point about the machine—that was that the castings were amply heavy and would probably repay the work put out on them.

The traverse screw was in reasonable condition and beyond adjusting the locknut which takes up the end-play nothing was done to it. The automatic traverse gear consists of a ratchet wheel which slides along the feed screw with the carriage rotating the screw and thereby feeding the carriage along by means of a key engaging in a keyway cut the whole length of the screw. The ratchet wheel is actuated by a pawl hanging from the ram. The feed operates at the beginning of each stroke and is not variable. It is intended to improve the feed mechanism and to provide for varying the feed rate "some day" but, so far, nothing has been done about it.

The next thing to be done was to make a tool holder. This is shown at *b* in Fig. 2 and is quite a straightforward piece of turning and filing. The operating lever is shown at *L* (Fig. 3) and is made in two parts as shown. The reason for this is that the hut which serves the family as a workshop is very small and by folding up the handle of the shaper one gets better access to the bench vice which is rather too close to the shaper for comfort.

A Difficulty Overcome

While this preliminary work was going on a scheme was gradually being evolved to get over the table difficulty. Fig. 3 shows the method decided upon. It will be seen that the idea was to bolt the head to the short side of the knee bracket and to fit to the long side of the bracket a vertically adjustable table. The table was to consist of a standard angle-plate such as could readily be purchased from tool dealers.

It was originally intended to use a heavy box-type angle-plate with tee-slots on the top and open slots on the sides. On enquiry, however, it was found that such angle-plates were altogether too expensive, and we used the simple type shown, stiffened by a piece of ½-in. plate screwed and dowelled on one side. A series of ⅝ in. holes was drilled in this plate so that long jobs might be bolted to the side of the table for shaping. This feature has not been made use of so far but may prove useful yet.

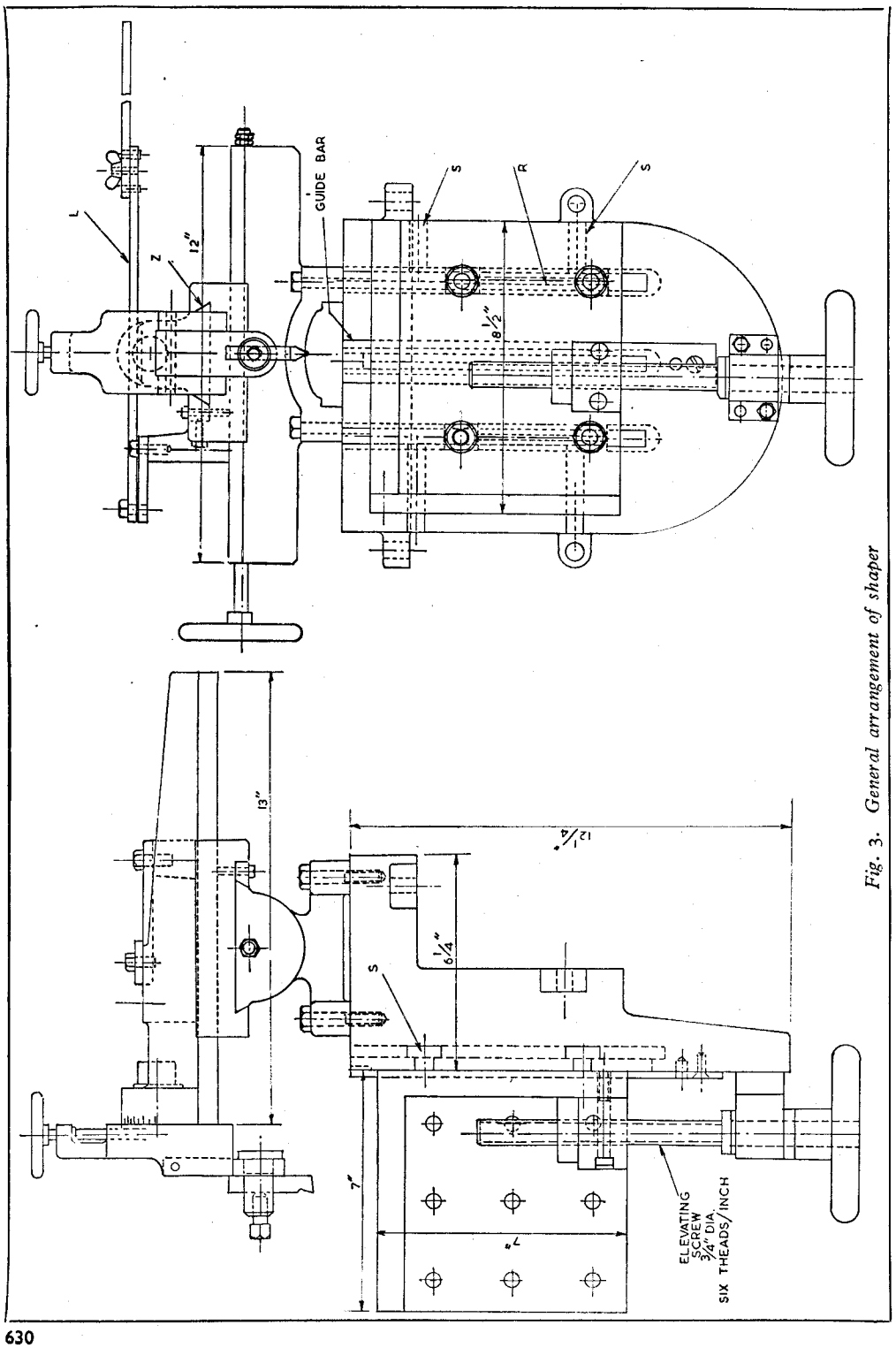


Fig. 3. General arrangement of shaper

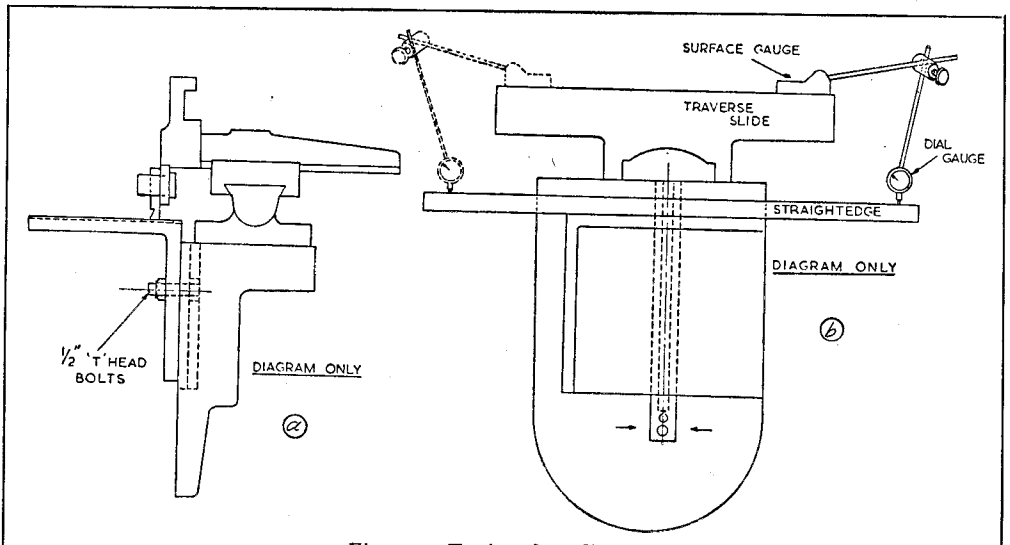


Fig. 4. Testing for alignment

Barely Room to Bend

It was determined that the table must be readily adjustable up and down. We were not going to be satisfied with adjusting the table by slackening off clamping bolts with one hand while holding up the heavy table with the other —especially in a cramped workshop where there is barely room to bend down! No, nothing short of a screw adjustment would do!

To provide a slide for the table and ensure that it travelled in a smooth vertical path it will be seen from Fig. 3 that a key or guide-bar (see Fig. 2c) was fitted to the angle-plate and a key slot cut in the table. To cut the slot the shaper itself was pressed into service. The head of the machine was bolted in place on the knee-plate, suitable holes being drilled for it. The table was then temporarily bolted to the front

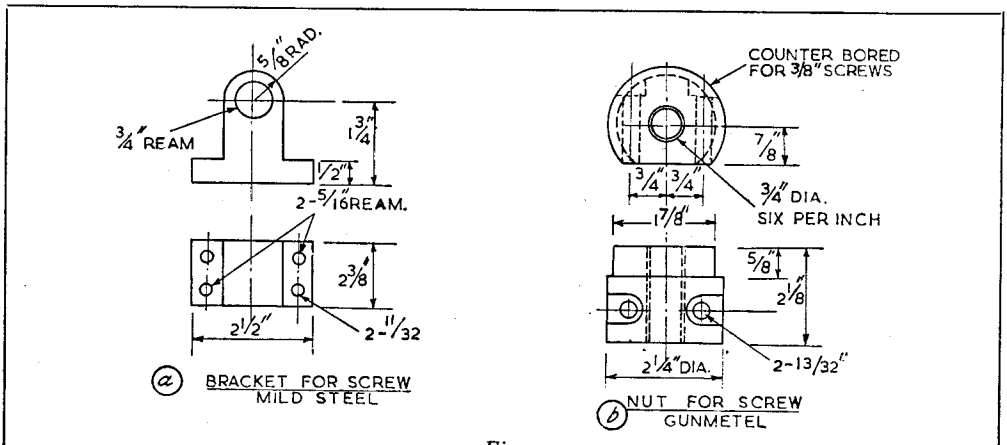


Fig. 5

Well, a suitable screw was found. In its earlier life it had done duty on an office chair of the adjustable type. Unfortunately, the screwed part was found to be just a little too short so that the Drummond had to be set up to extend the thread. It would almost have been as easy to make a complete new screw but we all learn by our mistakes, and anyway, good use was made of the nut from the same chair.

of the knee (see Fig. 4a) being carefully brought into parallel with the traverse slide with the help of a dial gauge.

With a suitable toll in the tool-holder, it was found to be quite easy to make a satisfactory job of the slot. So much so that, although it had been intended to file up the key *C*, it was actually machined on the shaper instead, while clamped on the top of the table. Owing to the length it

could only be machined crossways, and the long edges had still to be finished by hand.

It will be seen that a short projection is left on the bar at one end. This was made a good fit in the centre tee-slot of the large bracket. When clamped in place by temporary screws, it will be clear that, owing to the short length of this fitting piece, it was quite easy to bump the bar slightly from side to side at the bottom end. Fig. 4*b* shows how this enabled the table to be aligned to the traverse slide. The table bracket, which was a good sliding fit on the guide-bar, was located on the bar and lightly clamped in place. A long straightedge was then laid across the table. With a dial gauge mounted on a surface-gauge, it was then easy to test each end of the straightedge, and by tapping the guide bar at its lower end to get the gauge reading equally at either end. When this stage was reached, a dowel hole was drilled and reamed through the bar into the bracket and a well-fitting dowel was tapped home. The screws retaining the bar were then finally driven home and this part of the job was passed as satisfactory.

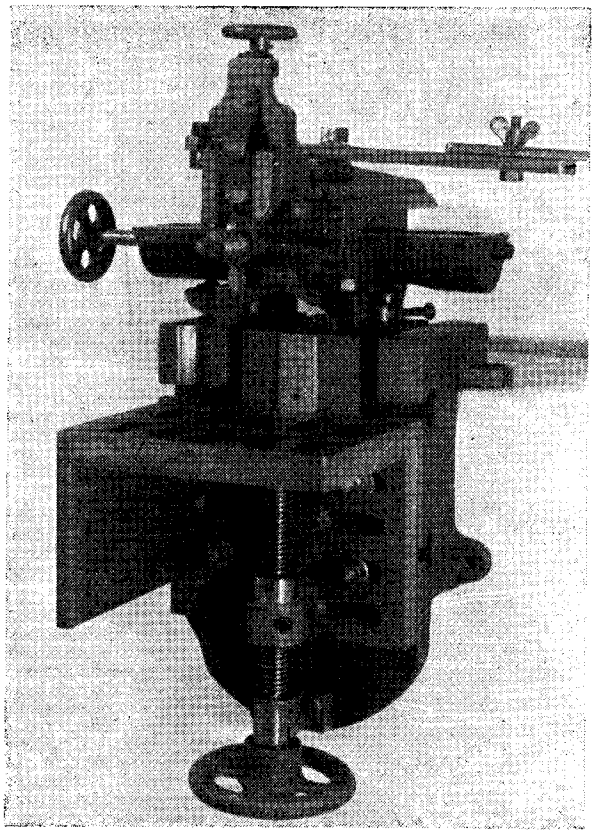


Fig. 6. The finished article

Tee-bolts

The next job was to turn a set of four tee-bolts for the table. The heads of these were machined to fit the tee-slots on the large bracket on the shaper itself. When the table was assembled on the bracket with these bolts it was found that the table could be adjusted up and down quite easily, but there was a tendency for the tee-heads to jam when passing the cross tee-slots on the bracket (see *S* Fig. 3). To get over this a $\frac{3}{16}$ in. hole was drilled through all four nuts, and a piece of $\frac{3}{16}$ in. rod was driven through each pair as shown at *R* Fig. 3. This effectively lined up the nuts even when passing the cross-slots.

The only thing left to be done was to fit the adjusting screw. The bearing bracket (*a*, Fig. 5) was machined to shape on the shaper and fitted in place as shown in Fig. 3 with two screws and two dowels. The nut is shown at *b*, Fig. 5, and its peculiar shape is due to the fact that it is actually the nut belonging to the chair from which the screw came. All that was done was to machine a flat on one side and to drill and counterbore it for two retaining screws as shown. The hand-wheel on the elevating screw is 5 in. diameter and is fixed to the screw by two $\frac{5}{16}$-in. grub screws. Thrust washers of brass are fitted above and below the bearing bracket.

A Little out of Proportion

The various bits and pieces were finally cleaned up and fitted together and the final result is shown at Fig. 6. It will be seen that the machine looks a bit out of proportion, the bottom part being too large and massive for the upper part, but in spite of its appearance, the machine has proved completely satisfactory and has done quite a lot of good work. The large table and convenient vertical adjustment have been most useful features.

It may be of interest to note that this is the machine on which the experiment of cutting gears by a generating method was tried—as described in a past issue of THE MODEL ENGINEER.

Can Anyone Help ?

E. W. Hilsdon, 348, Milton Road, Auchenflower, Brisbane, Australia, writes :—" Wishing to build 2½-in. gauge locomotives, *Annie Boddie* and *Dyak* as a first attempt, I sent to your advertisers for blueprints. However, the only ones I could obtain are those which you publish for *Dyak*. While these are excellent drawings, they are incomplete, as a lot of details are missing. I was therefore, wondering if any of your readers have the necessary issues containing the ' words and music ' of *Dyak* and *Annie Boddie*, for which they have no further use. Hoping your readers may be able to help me in the above matter."

Accidents

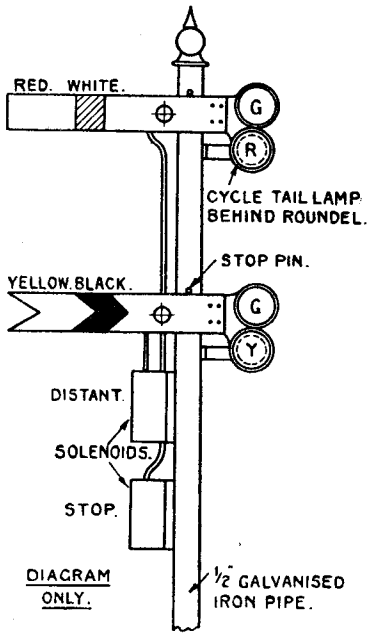
WILL *Happen!*

by "L.B.S.C."

THIS week, by the good rights, I should have given details and drawings of some more bits and pieces for *Britannia*; but as Bobbie Burrrrrns said truly, "The best laid plans o' mice and men gang aft agley." We have a small central-heating boiler in our hacienda—learned that trick in U.S.A.—but it is over twelve months, time of writing, since the coal-merchant delivered any boiler coal for it, and over four months had elapsed since the last ton of coke arrived. No fault of the coal-merchant; such are the "benefits" of nationalisation, he just couldn't get it to deliver. The boiler was out, and the house cold, all February and March; but at long last, after application to the fuel office, a ton of coke eventually arrived, and you can bet your sweet lives that never was an engine on the old L.B. & S.C. Railway lit up more quickly than our boiler. We had been trying to keep warm on two Primus stoves and a Tilley lamp, and were very nearly eating and drinking paraffin! We keep the coke —when we get any!—in the *ex*-air-raid shelter under the garden; and in my haste to get the place warm again, I stumbled when coming up the steps with a heavy pailful of coke, and badly wrenched my left ankle. At the present minute it is twice its normal size, very painful, and it is a physical impossibility to stand at my drawing board, and do the needful for *Britannia's* blobs and gadgets; so I beg your indulgence if this week we have another lobby chat which won't need drawings made especially for it. You may be interested to hear of my latest bit of realism.

The Third Section

Regular followers of these notes will recollect that early last year, I installed automatic signalling on my little railway, and the whole bag of tricks has worked wonderfully well. The few personal friends who have run on my road, have been tickled to death at the uncanny operation of the old Coulsdon signal (the kiddies are still looking for the wire which, they fondly imagine, connects it to the full-sized signal-box on the railway bank) the three-aspect colour-light, and the little upper-quadrant "distant" which repeated the colour-light. However, this was not exactly operating according to full-size practice; as the "distant" was a repeater only, nothing happened when a train passed it, and it did not go to "caution" until the train passed the colour-light, and entered the section ahead of it, putting the colour-light to red. That in itself was O.K. but the trouble was, that the track-circuiting ended at the distant signal; and in consequence, as soon as a train passed it, the Coulsdon signal cleared, and although it never happened, a following train *could* have chased the preceding one, and collided with it before it passed the colour-light.



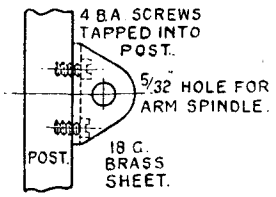
General arrangement of the new two-arm upper quadrant signal

For a long time past, I have wanted to add a stop signal above the distant arm, controlling same like a full-size relation, and finish the track circuiting so that we have three complete sections. Just recently, as a break from the "eternal grind," I decided to make a bold dash, and tackle the job. On one of the few sunny afternoons, I took the distant signal down. At time of writing, the conversion is practically finished, and ere these notes appear in print, the whole lot should be working, same as in full-size.

The Alterations Needed

You'll maybe recollect that the "distant" was a combination of an upper-quadrant semaphore arm with a two-aspect colour-light showing yellow or green only, and operated by contacts on the weighted lever. With two arms and two lamp-boxes, the signal would have been too clumsy, so this time I decided on spectacles attached to the arms. By the kindness of Mr. A. B. MacLeod I was able to obtain the weeny spectacle glasses from British Railways, so there is no question of their being the wrong colour! All the fittings were taken off the old signal post (which is made of galvanised iron pipe) and the unwanted holes plugged up with screwed plugs filed off flush, as it isn't advisable to let any water get into the post, among the wires. A square-ended "stop" arm was cut from a piece of 20-gauge rustless steel sheet (loud cheer from Bro. Hyphen) to the same size as the notched

distant arm. The spectacle frames were turned from a piece of 1½ in. × ⅛ in. copper tube, this being recessed just enough to take the glasses a fairly tight fit. The glasses are 3/32 in. thick, so the frames are just over ⅛ in. wide, and it makes a very neat job. Each pair of frames was silver-soldered to a triangular piece of 20-gauge sheet brass—jewellery job, that !—and the brass plates were riveted to the ends of the arms by 1/16-in. rivets. The glasses were pushed into the rebates



Bearing for arm spindle

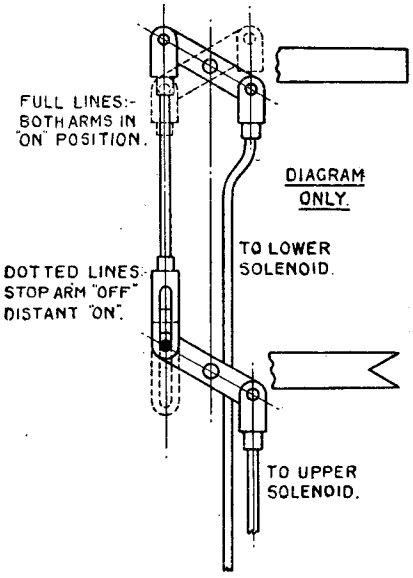
in the frames, and a few judicious centre-pops with a fine punch, around the edges, made certain they wouldn't fall out of their own free will and accord.

The original single arm was counterbalanced by a weighted lever, but this time I decided to do away with extra levers and weights, and let the arms do their own " as-you-were " act without assistance. This was easily accomplished by putting a small leaden weight on each of the brass plates connecting the spectacle frames. It is out of sight, being on the post side of the arm, and practically hidden by the lamps. The original arm spindle went right through the post, but this wouldn't have given sufficient leverage ; so I made a couple of 18-gauge sheet brass bearing brackets in a few minutes by aid of the invaluable Diacro shear and bending brake (how I managed without those tools, is beginning to puzzle me !) and screwed each one to the post, in its correct position, by two 4-B.A. brass screws. The spindles are 5/32 in. hard bronze rod, running in plain drilled holes in the brackets ; if they ever wear, I'll bush them, but I don't think they will, as the movement is so small, and the plain bearings of my toy oscillating engines of 60 years and more ago, lasted well, though the spindles made more revolutions in five minutes than the signal-arm spindles will make in half-a-century. Both ends of the spindles are screwed; the arm is at one end, held between two nuts, and the operating crank at the other end, fixed in the same way. A 5/32-in. stop-pin screwed into the post just above each arm, prevents the arms dropping below the horizontal position. They cannot go up too high when giving the all-clear, as the movement is controlled by the armatures of the solenoids.

" The Works "

The solenoid operating the distant arm, is the original one, which came from a broken direction indicator (trafficator) off a car, and occupies the same position on the post, as it did before. This time, however, instead of pulling on a separate counterbalance lever, it acts directly on a little crank attached to the other end of the spindle carrying the distant arm. My good friend Dick Gosden came to the aid of the party with another solenoid which is a little more powerful ; and this merchant is located just below the original one. It is connected to the crank on the stop arm spindle by a bronze rod and forked joint. Extra power was needed here, as this solenoid has to put both arms to the danger position when a train has passed ; beginners may like to know that when a distant arm is located underneath a stop arm, the former must never show " clear " when the latter is at " danger." The stop signal clears first, and then the distant (when the section ahead is clear), but they always go " on " together.

In the present instance, it was a simple matter to arrange this. The actuating cranks on the signal arm spindles were extended backwards, and connected by a rod. The upper end of the rod carries the usual forked joint, but the bottom end has a slotted extension-piece attached, which works on a pin at the end of the crank. When the stop arm clears, the slotted part slides down over the pin in the distant crank, without moving it. When the distant arm clears, the pin slides down the slot, and comes up against the end of it, so that when the stop arm goes to danger, it pulls up the rod, and the pin with it, thus putting the



How stop arm controls distant arm

distant arm to danger—or strictly speaking, caution—as well. It will thus be seen that the distant arm can only move when the stop signal is showing " all clear." The sketch should show this clearly.

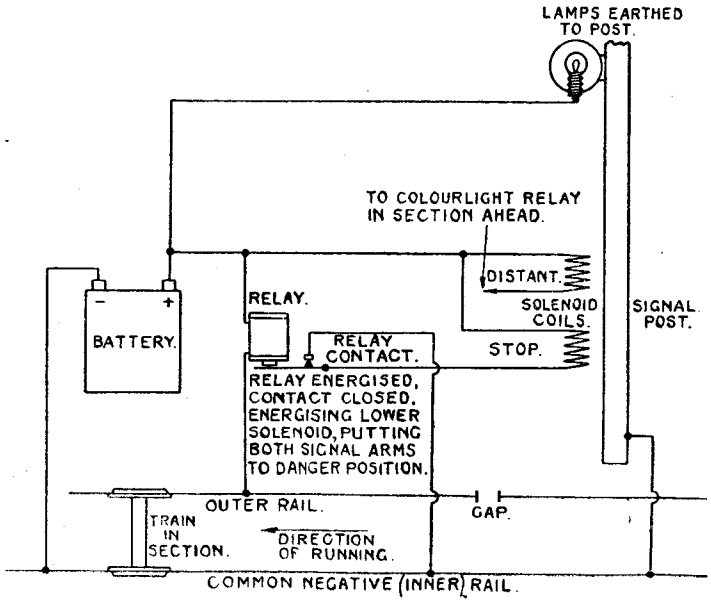
How Milly Amp Works It

The wires from the lamps and solenoids run down inside the post to a junction box at the bottom. A common positive wire feeds both

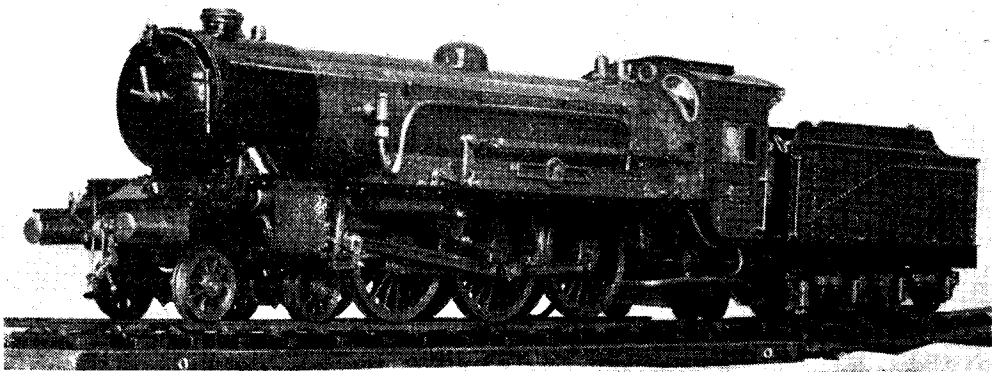
lamps and both solenoids. The lamps, by the way, were originally intended for cycle tail lamps ; the red glasses were replaced by plain ones, and the original bulbs superseded by 12/14 volt car bulbs. The lamp bodies are attached to the post by small brackets, so that they shine through the coloured spectacles ; the return current goes through the post, thus saving one wire, the post being earthed to the negative running rail. The return wires from the solenoids are attached to separate terminals in the junction-box.

The current consumption of the stop-arm solenoid is 2 amps at 12/14 volts ; and as I didn't want this amount going through the wheels and axles of the engines and cars (you don't expect to see "fireworks" around the wheels of steam rolling-stock !) the main current goes through a relay, kindly presented to me by friend L. Fletcher, of the Bickley Light Railway. The wire from the solenoid is connected to one contact of the relay, the other being connected to the negative rail. One end of the relay coil is connected to the common positive wire, and the other to the outer rail ; the current consumption is only a few milliamps. The action is as follows : The signals are normally at the " clear " position, with both solenoids and the relay de-energised. As soon as a train passes the gap in the rails opposite the signal post, the wheels and axles electrically connect the two rails, closing the relay circuit. The relay then acts, and switches the juice on to the solenoid operating the stop arm, which flies to the danger position with great alacrity, taking the distant arm with it. This state of affairs continues until the train reaches the colour-light and leaves the section, breaking the relay circuit, and de-energising both relay and solenoid, thus freeing the stop arm, which immediately clears. Meanwhile, the relay operating the colour-light has been energised by the onward passage of the train ; and a pair of contacts on this, have energised the solenoid operating the distant arm, holding same at caution, although the stop signal has been released. This position is held until the train runs out of

(*Continued on page* 640)



How " Milly Amp " does her share



A variation of " Fayette " by Mr. E. J. Szlumper

LATHE CHUCKS

Their Choice, Fitting and Care

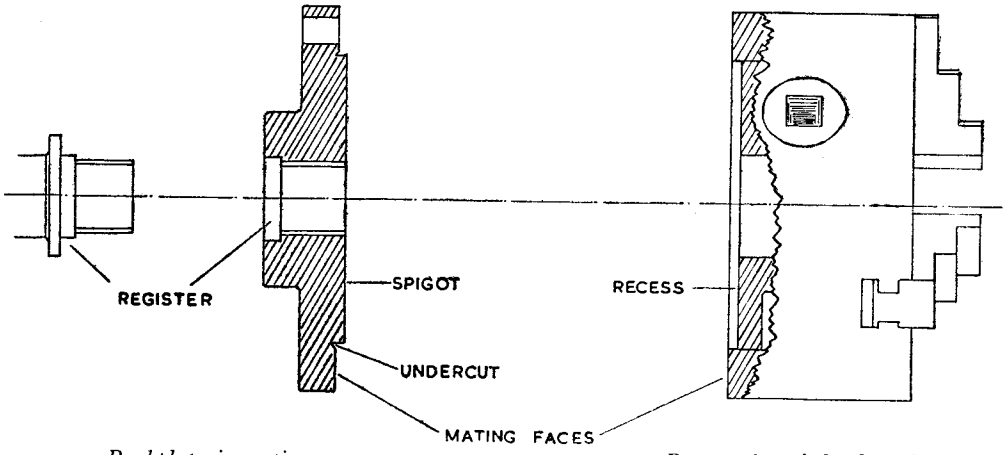
by A. O. G. Usmar

GENERALLY, the amount of money one has to spend is the strongest factor when choosing a new chuck and, if the choice is to be limted to one, then it would be wise to choose a four-jawed independent model, for it will then be possible to grip irregular shapes as well as circular ones; but, if there is a prospect of a second chuck within reasonable time, make the choice a self-centring model. It will save a great deal of time and patience which will otherwise be wasted when setting up circular shapes, which are by far the more common.

Most people find that in the usual run of work the independent chuck is seldom required, but that getting over its absence is a tiresome business. For convenience, both types of chuck are required, but, if both are beyond the pocket, the independent model will be found to be able to do its own work and that of the self-centring one as well, whereas the self-centring pattern is unable to do more than its own job.

Whichever is decided upon, the following remarks apply regarding size and method of fitting. Let us consider the points which affect the size.

Often the criticism is raised that a certain chuck will be too heavy for a particular lathe. Cutting pressures tend to lift the chuck and with the exception of the lightest cuts will always exceed, often many times over, the downward pressure of the weight of the chuck. It follows that wear which occurs is not likely to be worsened by the weight; on the contrary, this will partly counterbalance the upward pressure. A light chuck will not be able to do this, nor will it perform an even more useful function which the greater mass will do, namely, that of damping out cutting vibration which will be beneficial both to the bearings and the finish on the work. Further, since the bearing areas of the chuck both inside and out, will increase as the square of the linear increase, wearing qualities will be improved and there will be less likelihood of overstraining the mechanism, particularly the scroll.



Backplate in section *Part section of chuck to show recess*

Fig. 1

There will be some slight decrease in capacity of the larger chuck compared with the smaller in the length between the tailstock and the chuck face but the other advantages are so great that this small sacrifice is worth while.

To make the greatest possible use of the lathe the chuck size should be such that with the jaws opened to their maximum with one full thread of the scroll engaged, the jaws themselves just clear the bed.

There may be a further choice between a steel body and a cast-iron one. The strength of the steel body is not a serious point with a small lathe for the saddle and slides are not so strongly built that there is much danger of tearing a jaw out of the chuck due to the cutting load, and the self-lubricating properties of cast-iron together with its hardness and price make it preferable.

These then are the points which determine the size and construction of the two types; the choice of manufacturer must be an individual one; suffice it to say that with such a precise and complicated mechanism, high quality and low price are unlikely companions.

It is undoubtedly better to order the maker of the lathe to fit the chuck to the mandrel nose

but if this is not possible the buyer must fit his own.

Let us suppose you have just purchased the chuck. You will have the chuck only, with a second set of jaws, a key and three hexagon-headed screws known as cap screws. To fit the chuck to the lathe a plate called the backplate is required. (See Fig. 1.)

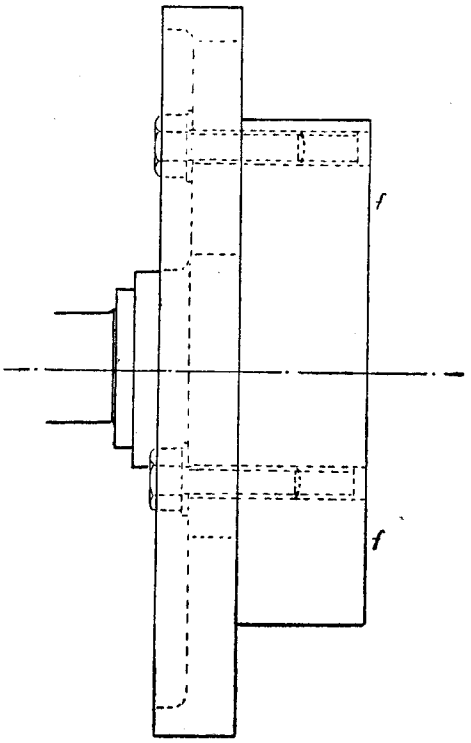


Fig. 2

This fits into the recess in the back of the chuck. If it is possible, purchase this plate from the lathe maker as a blank with the thread cut, but if it is not possible to do this obtain a circular piece of mild-steel as large as the chuck and of such a thickness that when it is finished it will be a little thicker than the length of the mandrel nose.

If you prefer, a special casting can be obtained, but it is hardly worth the trouble of making the pattern.

Now compare the nose of your lathe with the drawing, Fig. 1.

It will be found that there is a short thread followed by a parallel portion which may be the same size as the thread or perhaps a little bigger and this will end in a collar with a flat face which should be truly at right angles to the centre line of the mandrel. These two together form the register which should ensure the truth of the chuck, the thread serving to hold it on and nothing more. It follows that particular care should be taken to secure a good fit by the back-plate at these points.

Note that in some makes of lathe a second register forward of the thread and of the core diameter is provided. This makes the thread cutting a little harder since the cutting must be close to a shoulder but offers no other difficulty.

The screw cutting is not so formidable as it might at first seem for although the better the fit the less wear will the mandrel nose receive it

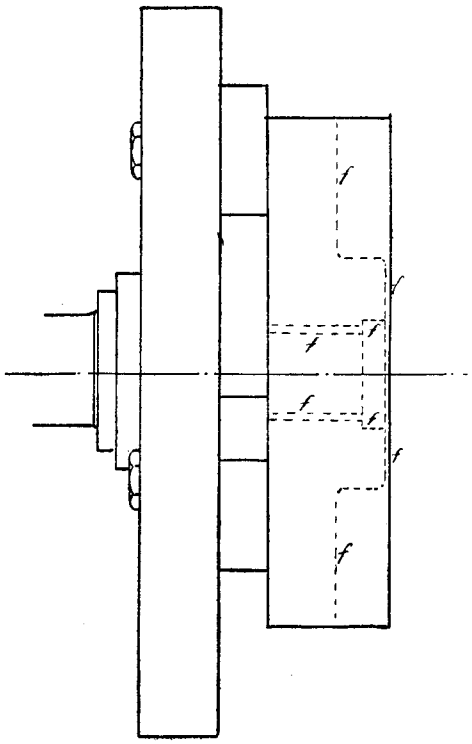


Fig. 3

will be seen that the final accuracy is secured by the fit of the register.

Before the backplate is machined a gauge must be prepared. This gauge should be a short piece of mild-steel turned between centres. It is intended to be an exact copy of the parallel part of the mandrel nose at one end and to have the same diameter as the core of the threads at the other.

This diameter can be obtained by turning the plug until it will just push through the threads of the faceplate and the large end should just fit into the recess for it is this which must be duplicated in the backplate.

Taking the centres of the cap screws from the chuck they should be set out on the new back-plate and drilled tapping size and counterbored to the outside diameter of the screws at least one thread deep before tapping. This will avoid the drill running out when the holes are enlarged to pass the cap screws through when it is finally fixed to the chuck.

Tap these holes and use them and the cap screws to hold the blank to the faceplate. If it is

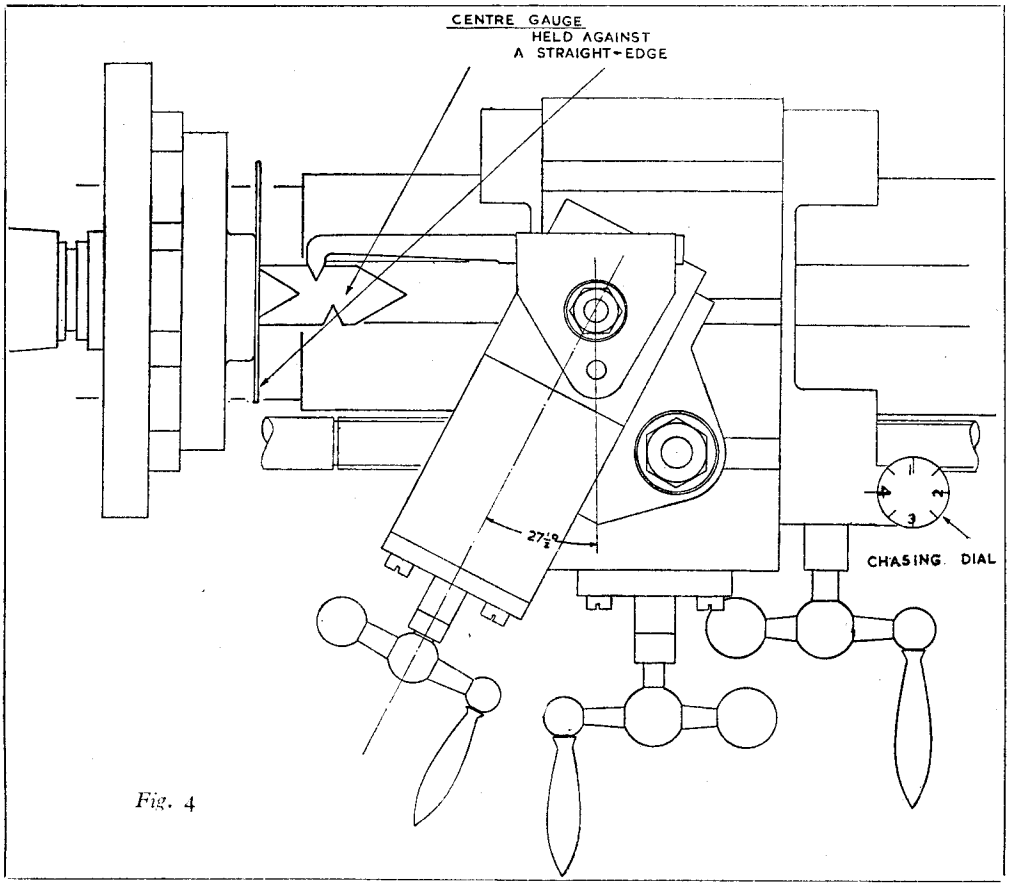


Fig. 4

a solid slab of mild-steel secure it counterbored side outward for the first machining and if it is a casting, the side which will eventually go into the chuck should face outward. (See Fig. 2.)

A casting should have this face rough-turned with a good cut which will get under the scale and should be followed with a light finishing cut. A solid mild-steel plate must be treated in much the same way except that there is no scale under which you must cut.

Now reverse on the faceplate but insert parallel packing pieces about ⅜ in. thick to hold the plate clear and permit you to bore and screw the plate right through.

When this stage is reached and machining commences, it must not be removed until it fits the mandrel nose accurately and all trials for fit of the screw thread must be made by screwing faceplate and blank off the nose and trying them as one piece. This is most important.

If the blank is mild-steel, face across and turn away the excess metal to produce the shape shown dotted in Fig. 3, and, if it is a casting, deal with it in the same way except that you will be spared a lot of work.

Do not skip this as unnecessary if it is a casting for it relieves the skin stresses as well as improving the balance.

The next step is to drill and bore out the centre until the core size plug gauge fits.

If you have never cut a screw thread before it might be as well to cut a few practice ones before this one in the backplate. As you have no fitted chuck to hold short pieces of rod bolt a piece of bar, say, 1 in. square to the faceplate and bore and cut a trial thread or two in that. The method of cutting will be described for the actual thread in the backplate but the same points apply to the trial cut.

Set up the change wheels for the required pitch, set the topslide over to 27½ deg., mount a threading tool in the toolpost exactly on centre height and at the same time set it by a centre gauge so that it will produce thread flanks which have the same angle to the perpendicular of the screw. (See Fig. 4.) Set the topslide in the middle of its travel, shift the cross-slide and the saddle until the tool point just touches the bore, taking care to see that the backlash of the cross-slide is taken up. To do this the tool must be set too far in and turned back. Once more wind the saddle clear of the work. If the lathe has no chasing dial it must be started in back gear, the leadscrew engaged and as soon as the saddle starts to move the machine must be stopped. Chalk marks must now be made on the faceplate and the top of the leadscrew and

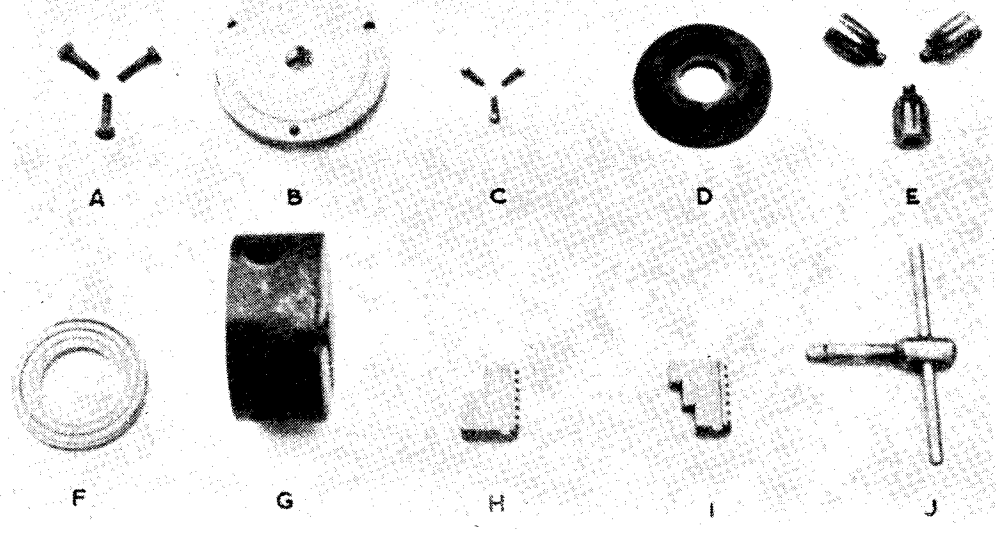
on the bed at the back edge of the saddle. Each of these marks must coincide before the leadscrew is re-engaged at the start of each fresh cut. Possession of a chasing dial makes things much easier. Not to complicate matters, engage leadscrew as soon as the dial reads 1 and re-engage each successive cut on the same number.

Traverse right through the bore into the clear space made by the packing pieces and quickly disengage the leadscrew. No mention has yet been made of applying the cut. Feed in by the top slide and err on the light side ; make your first cut 0.015 in. deep and as the full depth is approached decrease the cut. The last scrape should be taken by feeding from the cross-slide and not the top-slide. Make frequent trials when approaching size and secure the best fit you can. If the thread happens to be a standard size and you have a tap which you propose to use to clean out the last scrape do support it by a centre in the tailstock which will ensure that the tap is guided truly. After this has been done bore out the register measuring with the large end of the plug gauge until the gauge will slide in a gentle push fit. Face the back with a light cut and remove the burr.

Finally, after thoroughly cleaning it, try it on the nose and see that it screws right up to the collar without check, and not until this has been done may it be removed from the faceplate.

When this is completed grease the thread and screw it tightly on the nose. Turn the outside diameter to agree with the chuck and remove the sharp edge at the back. Using the same tool, take a light cut across the face to bring it true. Now change the tool for a very sharp knife tool and make the spigot to stand out the right amount but to be slightly too large. The right length for the spigot will be found by measuring the depth of the recess in the chuck and making the spigot a little less, for it should not bottom when fitted ; the outer face through which the cap screws pass and the corresponding face of the chuck are the correct mating faces.

At this point proceed to reduce the spigot for a third of its length until it can be pressed into the recess and, when this has been done, the remaining two-thirds can be brought to size quite quickly but do not trust the first third absolutely, make instead trials for the last two or three thousandths. Undercut the spigot as Fig. 1 and make sure that the chuck can be pressed right home before counting the fitting complete.



The component parts of a chuck

This method of trying the fit on a short length should be employed when boring the parallel register of the thread ; it has the advantage that overshooting does not spoil the job since there is still plenty left and, as far as the large spigot goes, if it happens to be exceptionally short it is always possible to face away the first third and have another start.

The backplate must now be removed from the nose and if it cannot be moved by hand, fit two screws, not the cap screws, through the tapped holes and with a bar between them as a lever, free the plate. When it is off open out the three tapped holes clearance to the cap screws drilling from the counterbored side. Grease the mating faces before bolting together but before closing this dismantle the chuck and fill it with soft grease, for it appears to be the practice of many manufacturers to assemble with nothing but a smear of oil on the working surfaces. Fill it completely with grease, not oil, for this would fly out when running.

In order to dismantle it, consider the construction as shown by the photograph.

(*G*) is the body, (*F*) is the scroll, really a thread on a flat surface running out from the centre unlike the more usual one which runs the length of a cylinder.

On the back of the scroll and in one piece with it will be seen a bevel wheel.

Three pinions (*E*) mesh with the scroll bevel when assembled. The inner plate (*D*) which closes the back of the chuck in this pattern also prevents the bevels forcing themselves out of mesh by fitting into grooves in their ends. This is not always the case, sometimes there are three long screws which enter from the back and these pass through grooves in the outside of the bevels to serve the same purpose. The inner or closing plate also holds the scroll in its correct position. The drill jaws are to be seen at (*H*) and (*I*) shows the chuck jaws. (*C*) are the screws which hold the inner or closing plate in position. (*A*) are the cap screws and the backplate is to be seen at (*B*).

The jaws mesh with the thread on the scroll and because the curvature of this thread is not the same throughout due to the constantly increasing diameter the jaw threads are a compromise and make only a very small surface contact and it will be seen that in a small chuck wear at this point is bound to be severe.

A further disadvantage is the tendency to draw small chips into the scroll by the wedging action of this peculiar shape and if the lathe is employed on brass or cast-iron for any length of time, the very small chips these materials make should be removed by occasionally washing the jaws in paraffin and by cleaning the scroll in the same way, pieces stuck to it being removed by tweezers if wiping will not dislodge them. This can be done without dismantling the chuck other than removing the jaws as the initial packing of grease should last for many years.

To dismantle it wind the jaws right out and remove them ; take out the three screws which hold the inner plate and the three which hold the bevels if the chuck is of that pattern. Turn the chuck on to its back and bring it down sharply on to a clean piece of wood supported firmly on the bench. This will lift the closing plate and permit its removal. Insert the key and turn it which will bring the three bevels above the surface and enable you to pick them out or it may be easier to push them out with your fingers from the inside.

The scroll may be removed by treating it as the inner plate or it may need tapping which should be done by a hammer against a piece of hardwood through the jaw slots not forgetting to tap each a little in turn.

Give it all a wash in clean paraffin and reassemble greasing each part as you go and finally pack the chuck with grease before closing the inner plate.

Scrupulous cleanliness is absolutely essential or it would be better to leave the chuck as it is ; it will be seen that in a well-made chuck no swarf or bits can enter from the outside and it is no part of our purpose to put it there from a dirty bench or tools or even from dirty hands.

When it is reassembled insert the jaws by winding the scroll backward until the outer end of the thread just diappears past No. 1 slot, insert No. 1 jaw, press home and turn forward and do the same with jaws Nos. 2 and 3 in that order. Catch each one first time round or you will have them out of step.

Fit the backplate, greasing the faces mentioned earlier, and pull the cap screws up tight.

Screw the chuck into the nose, put a bar into it and run it and I hope the results will make you very pleased with your work.

Finally, your chuck has been built for hard work and even if it is ill-used it will still give good service for a long time, but treated as it deserves to be, not overstrained and kept clean with particular attention to the nose thread and register, it will give you much better service and I think you will find that the little extra time this takes will be well spent.

"L.B.S.C."

(*Continued from page* 635)

that section, when the colour-light relay is de-energised, changing the light from red to yellow or green, according to the postion of the Coulsdon signal, and de-energising the solenoid holding the distant at "caution," allowing the arm to clear. A train in any one of the three sections, is now absolutely protected either by a semaphore arm at "danger" or a red light, which will not clear until the train enters the next section, which is as it should be. As matters now stand, the Coulsdon signal is repeated by the colour-light, which in turn is repeated by the little distant, but there is no advance indication of the position of the stop signal above the distant ; and as it is at the end of the south curve, advance indication would be advisable. This can easily be done by a two-aspect colour-light at the entrance to the curve, connected to the relay operating the stop signal. As I already have the colour-light which was taken off the original distant post, it only needs a fresh post to mount it on, and a few yards of bell wire to connect to the relay terminals ; so I hope to finish the job right off, at a favourable opportunity.

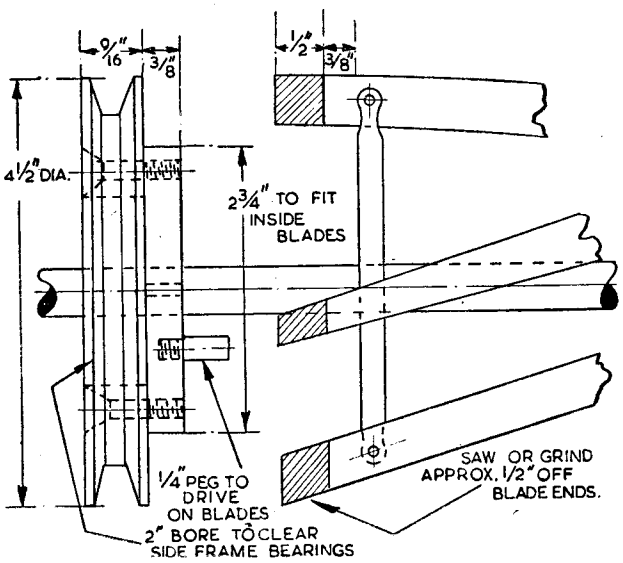
To your humble servant, locomotives are all-in-all ; and—like a famous engineer of bygone days—the railway is, to me, just a place on which to run them. However, all good engine-drivers are "signal-conscious" ; they *have* to be, anyway, otherwise there would soon be some pretty fine piles of wreckage all over the landscape ! That being so, it is hardly necessary to point out that a working signalling system, even on a little railway where only one engine is in steam at a time, adds a touch of realism to driving, which is only fully experienced by those who have earned a living on the footplate. I instinctively glance at the signals as I approach them ; and on a fine evening, maybe I'm driving *Grosvenor* when she suddenly grows to full size, and I'm speeding through beautiful Sussex on my way to the South Coast. Happy memories !

Motorising a Side-Frame Lawn Mower

by George Marsh

AFTER many hours of leisure spent in pushing and humouring my lawn mower, I began to look around for a method whereby I could motorise the machine. All the hints and tips that I came across dealt with the roller and direct-drive machines, and as my machine is a side-frame, difficulties arose in designing a motor drive to take into account the fact that the spindle of the cutting cylinder does not pass through the centre of the land wheels. This was overcome in the following manner and is giving very good results, having been used for the past three years.

I first bought one of the R.A.F. Surplus 1/6 h.p. motors. After an extended trial I found that this was not powerful enough, especially if I allowed the grass to grow a little too long, or if the weather gave us too much rain.



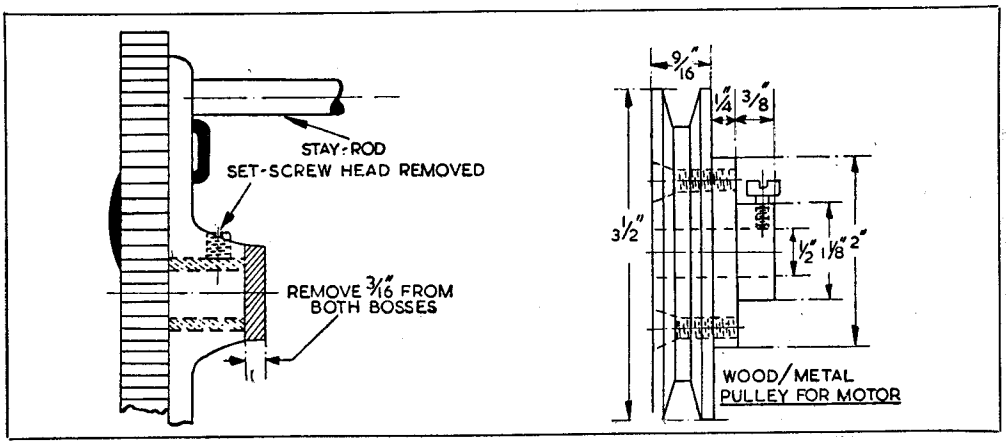
Best Results

When I used a ¼ h.p. motor, 1,425 r.p.m., these difficulties were overcome, and very good results were obtained. Using a 4½-in. pulley on the cutting blades and a 3½-in. pulley on the motor, this combination gave the best results and a cutting speed of just over 1,000 r.p.m. The motor is used with three-core cable to ensure the motor being correctly earthed. The pulleys are made from hardwood, the centre of the larger one having a steel core.

List of requirements: 4½ in. × 9/16 in. wooden pulleys, 2¾ in. × ⅜ in. thick steel plate (for blade pulley); 3½ in. dia. wooden pulley (for motor); three or four ¼-in. Whit. countersunk set-screws × 1 in. long; one "off-and-on" switch; 12 in. × 12 in. plywood base for motor; one suitable vee or round belt; length of three-core cable.

Preparation

The procedure was to first dismantle the mower and remove and scrap the two small pinions from inside the land wheels; the pinions have now no purpose to serve in the machine. Looking from the handle end of the mowing machine, the left-hand side of the cutting cylinder requires about ½ in. of the blade ends removing to make room for the pulley. As all blades are not hardened they could perhaps be sawn through



with a fine hacksaw. The distance from the new edge of the blades to the stiffener is $\frac{3}{8}$ in. to suit the steel plate. Drill a hole in the centre of the steel plate to fit the blade spindle, probably a $\frac{5}{8}$ in. dia. hole, and file a keyway in this to fit a pinned hole in the shaft in the correct position.

The 4½-in. pulley requires a hole bored in approx. 2 in. dia. to clear the side frame bearing for the spindle. The set-screw in this bearing may require the head removing. Secure this pulley to the steel plate by three or four countersunk screws. Build the pulley up and complete before boring out the 2 in. clearance hole; after fitting in position, an extra peg for driving purposes can be added.

A vee-belt is preferred although a round one may be used.

The treatment for the side frames is as follows: To allow for the insertion of the pulley, $\frac{3}{8}$ in. of metal will have to be removed from the faces of the bearings, so saw and file off $\frac{3}{16}$ in. from *both* bearing faces of the side frames. Whilst this allows for the cutting blades to move to the right by $\frac{3}{16}$ in. more than before, there is generally sufficient clearance to allow for this.

The 3½-in. pulley can be secured to a metal flange by set-screws, and screwed to the motor-spindle.

The Motor Mounting

The motor is mounted on a 12 in. × 12 in. plywood base with two elongated holes to allow for adjusting the tension of the belt. This base is fixed on the lower part of the wooden handle of the mower by two bolts. A cross-piece bolted on to this handle about 12 in. from the top allows the cable to be looped round the handle. A switch placed on the plywood base enables the machine to be switched on or off by the user.

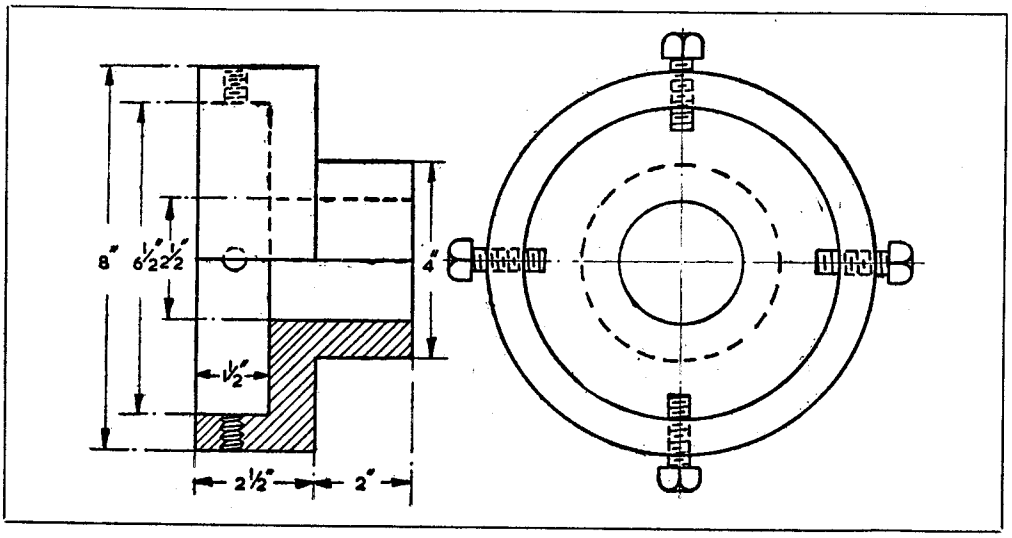
The sketches will further illustrate the alterations required, which any handyman with a workshop should be able to carry out.

An Adjustable False Steady Fixture

by R. Bennett

THE tool described should be a useful accessory for all model engineers. The idea came to me when I was stuck with a job which was 1½ in. bigger in diameter than the steady capacity. The job could not be centred by hand, as it was too near finished size and was also slightly bent. I had to have something to support the shaft and at the same time allow it to be adjusted one way or the other to make it true up all over. The sketch shows the tool made to fit a 6 in. diameter shaft and a 4½ in. capacity steady on a 8½ in. centre lathe. Readers can adapt it to suit their own requirements.

The fixture is set over the end of the shaft and the screws tightened and the 4 in. diameter set in the steady. The shaft can then be set true both at the chuck and steady or it can be thrown slightly out to bring the middle more in line. The shaft can then be centred from the tailstock, through the fixture.



IN THE WORKSHOP

by "Duplex"

No. 89.—A Screwcutting Attachment for the Drummond 3½-in. Lathe

A QUICK-CHANGE gearbox of the Norton type is most useful in the tool room where threads of various pitches have to be cut and time is not wasted in setting up the necessary gear trains.

The amateur, on the other hand, is largely dependent on the capacity of his lathe to do a great variety of work and, to this end, he may, for example, require the lathe quadrant for mounting a worm-reduction gear to traverse the saddle with the mandrel remaining stationary, or it may be necessary to secure a detent to the quadrant for meshing with a mandrel gear wheel when indexing work held in the chuck. Furthermore, for ordinary constructional work, he is in a position to decide what thread pitches he will use, and usually finds that only a few are needed for most purposes. With this in mind, a simple form of screwcutting attachment was designed and fitted to the Drummond lathe, but it could, no doubt, be adapted for use with lathes of other makes. This device normally remains in place on the lathe quadrant, and it in no way interferes with the working of the fine-feed attachment described in a previous article; that is to say, both mechanisms make use of the ordinary lathe quadrant and either can, at will, be operated independently of the other. The device illustrated consists of a small secondary quadrant which pivots on the locking collar fitted to the left-hand mandrel bearing bush. A 20-T. change wheel is attached to the mandrel, and a gear train composed of two standard wheels carries the drive to the leadscrew wheel.

The two wheels attached to the quadrant can remain permanently in place and, as the quadrant swings about the mandrel axis, the upper wheel will, at all times, mesh correctly with the mandrel

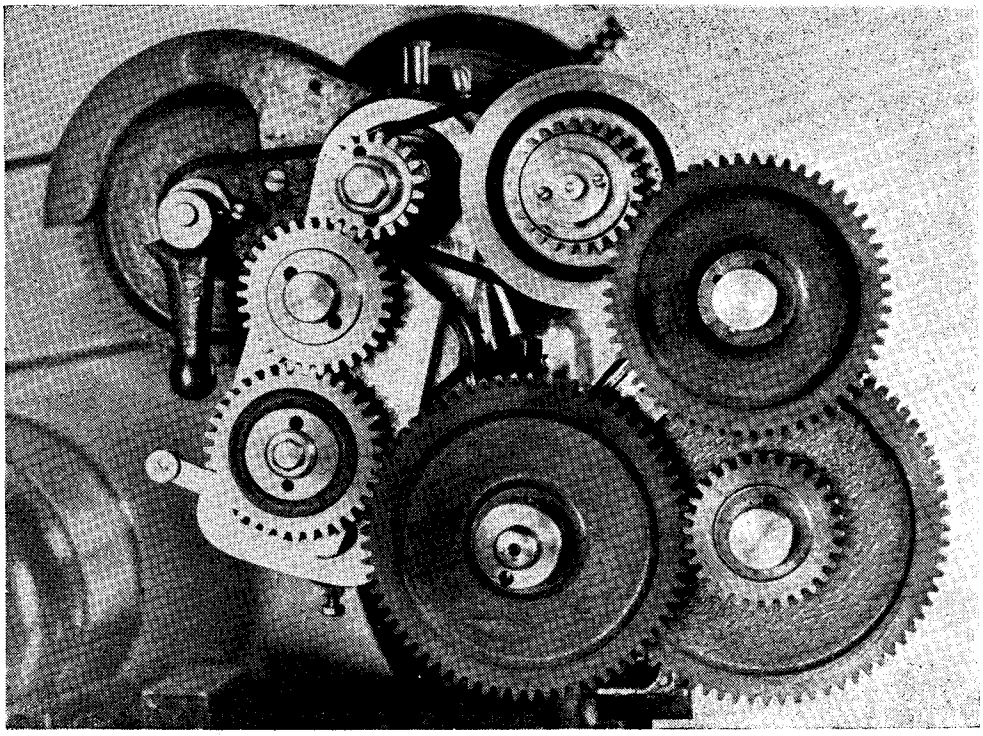


Fig. 1. The screwcutting gear fitted to the lathe

wheel. When altering the thread pitch to be cut, the leadscrew wheel, alone, is changed and the small quadrant is then swung to obtain the correct meshing. The thread pitches readily obtained in this way are tabulated below; these cover a sufficiently wide range for all ordinary purposes.

Mandrel Wheel	*Leadscrew Wheel*	*Threads per in.*
20 T.	40 T.	16
20 T.	45 T.	18
20 T.	50 T.	20
20 T.	55 T.	22
20 T.	60 T.	24
20 T.	65 T.	26

By removing the single clamp-nut retaining both quadrants in place, the small screwcutting quadrant can be removed, as well as the main

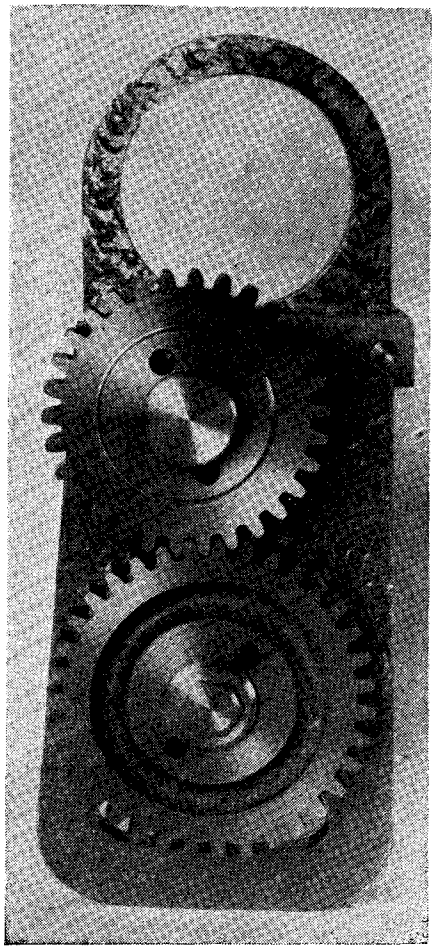


Fig. 2. The screwcutting attachment

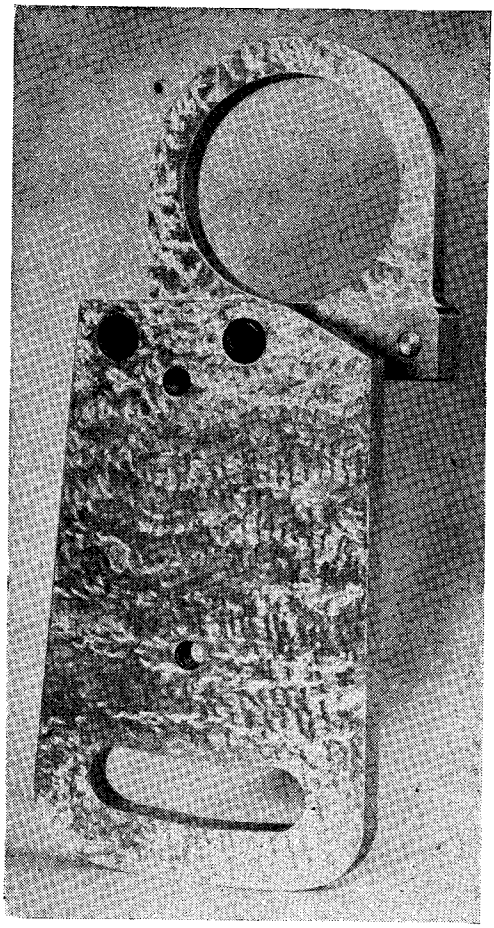


Fig. 3. The quadrant assembly

quadrant carrying the fine-feed gear train. Rather than disturb the fine-feed train, a spare, standard quadrant is kept for cutting any odd or metric threads; this change-over may save time and trouble, but is, of course, not really necessary.

Construction

The screwcutting quadrant is of built-up construction, as this is preferable to using a casting or attempting to machine the part from the solid, for in this way the parts are kept smaller and so are more easily marked-out and machined.

The upper pivot member, or eye, is made from a rectangular piece of $\frac{5}{8}$ in. mild-steel. This is secured to the faceplate by drilling and tapping two $\frac{1}{4}$ in. B.S.F. service holes at opposite corners; one of these holes is required later for the construction, and the other is cut away when the upper end of the part is made semicircular in shape. In this way, the component is faced on both sides and the bore is machined to fit accu-

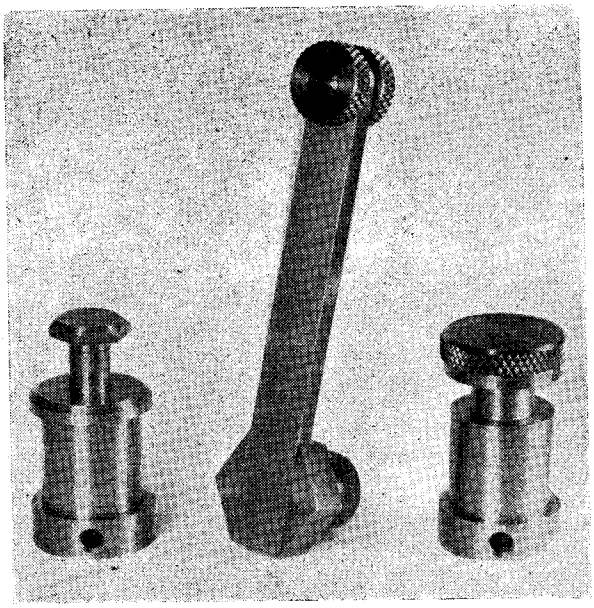


Fig. 4. The clamp lever and the two gear wheel studs

rately on the collar of the mandrel bearing-bush. This method of facing a flat piece of material is preferable to gripping the part in the four-jaw chuck, for the work is apt to rise as the jaws are tightened, and the two surfaces will not then be machined parallel.

The eye and the quadrant-piece are next assembled on the distance-piece to enable the centres for the gear wheels and the curved slot to be marked-out. The centre for the upper, 30 T, gear wheel is marked out by mounting the assembly in the lathe with the bore of the eye held against the outer surfaces of the jaws of the self-centring chuck. For scribing the centre-line, a V-pointed tool is set with its point on the lathe axis by using the headstock coned centre as a guide ; the cross-slide index is then set to zero as the tool is moved in an outward direction to take up the backlash in the feed screw. Next, as illustrated in Fig. 5, the V-tool is moved outwards from the centre-line for a distance equal to the two gear centres ; this is done with the aid of a rule, and the slide index is used to obtain the final setting, exact to within a thousandth of an inch.

The centre distance between the 20-T. mandrel wheel and the 30-T. first wheel on the quadrant is found by halving the total number of teeth on the two gears and dividing by the diametral pitch of the gears, that is to say 14 d.p.

$$\frac{20 + 30}{2 \times 14} = 1.786 \text{ in.}$$

When the V-tool has been set to this distance from the lathe centre-line, it is used to scribe an arc on the face of the quadrant ; the cross centre line is then marked-out from the edge of the work in accordance with the drawing, and the point of intersection of these two lines is marked with a centre-punch.

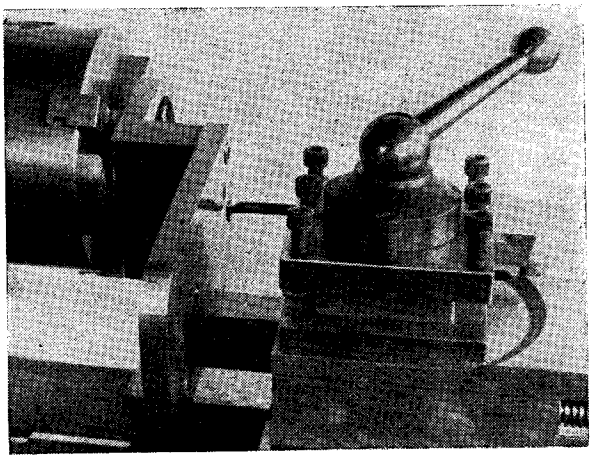


Fig. 5. Marking-out the gear wheel centre

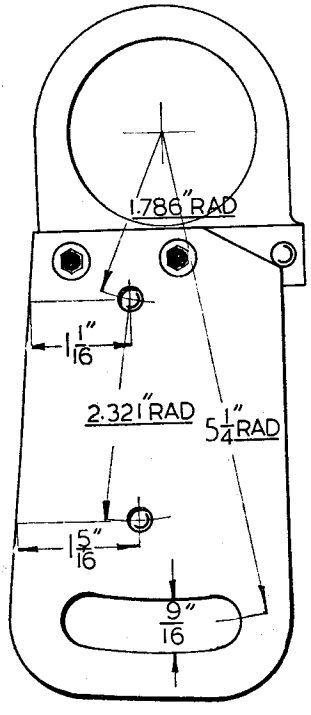


Fig. 6. Showing the position of the gear wheel and slot centres

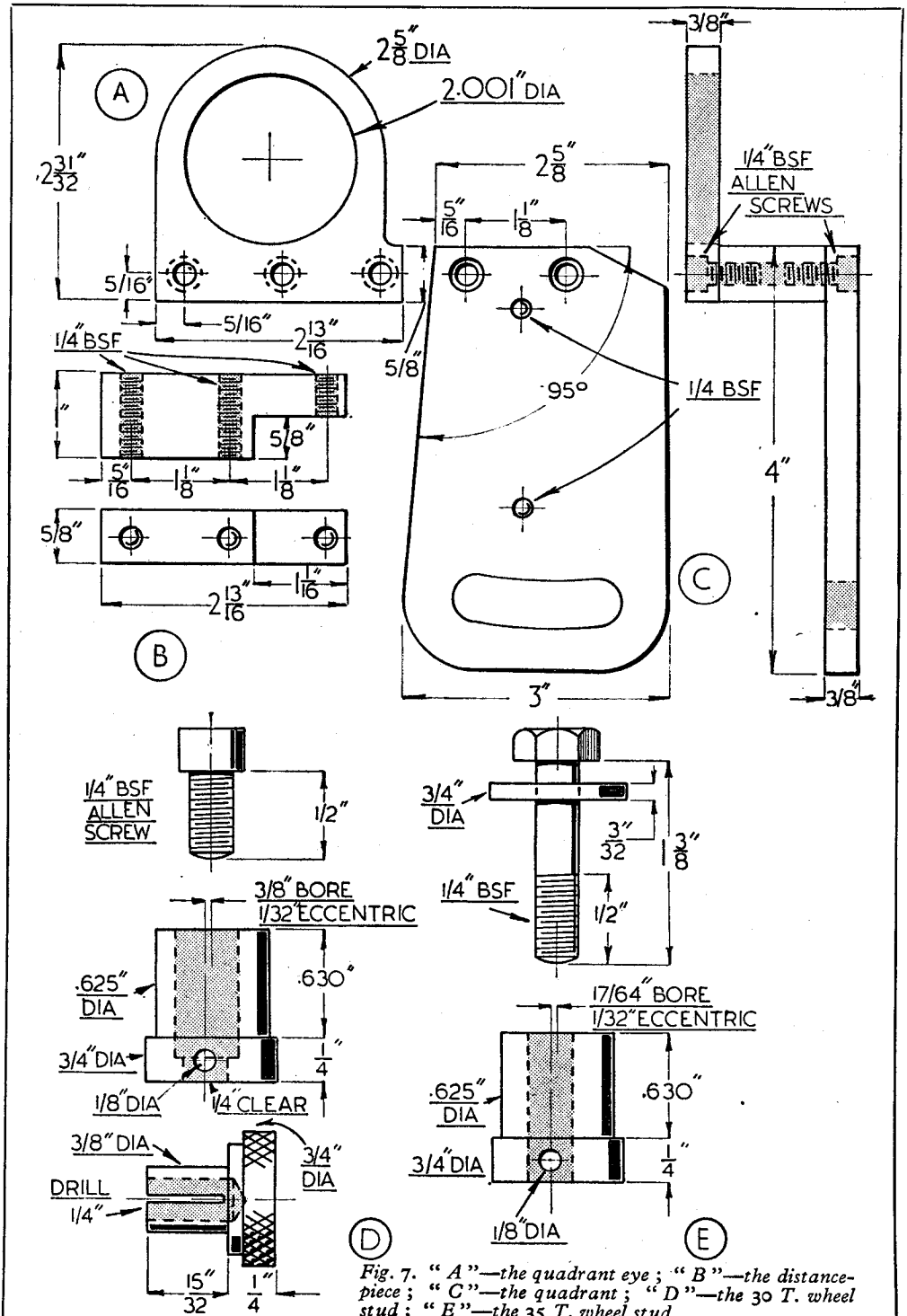


Fig. 7. "A"—the quadrant eye; "B"—the distance-piece; "C"—the quadrant; "D"—the 30 T. wheel stud; "E"—the 35 T. wheel stud.

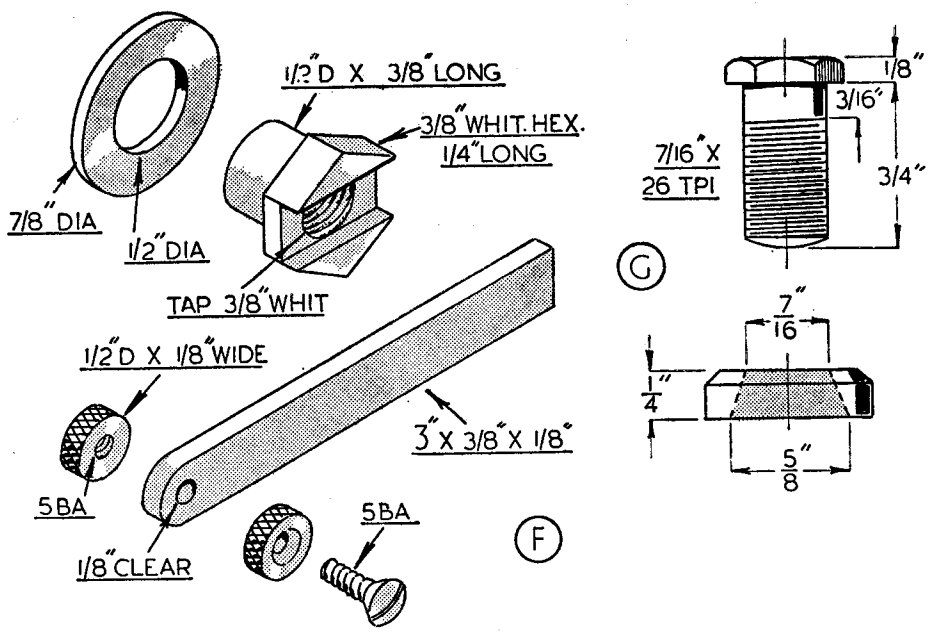


Fig. 8. "F"—the clamp lever; "G"—the mandrel pinion fixing screw

Before the work is removed from the lathe, the curved slot at the lower end of the quadrant is marked-out by setting the V-tool first to 4 31/32 in. and then to 5 17/32 in., from the lathe centre-line, so as to mark-out a slot $\frac{9}{16}$ in. wide at a centre distance of $5\frac{1}{4}$ in. from the centre of the eye.

The centre for the second, 35-T. gear wheel is marked-out from the centre of the previous wheel with the dividers set to 2 21/64 in.; this is 7 thousandths of an inch in excess of the theoretical distance of 2.321 in., but this discrepancy is immaterial, for as will be described later, the wheel pivots have a range of adjustment of $\frac{1}{16}$ in. The holes to receive the wheel pivot screws can now be drilled with a No. 3 drill and then tapped $\frac{1}{4}$ in. B.S.F.; at this stage, the curved quadrant slot is also machined or filed to the dimensions given.

The Wheel Pivots

As will be seen in the drawings, both the studs that carry the gear wheels are bored 1/32 in. off-centre in order to provide an adjustment to secure accurate meshing. It was, however, found on assembling the gears that the meshing was correct when the studs were at the mid-point of their adjustment. The studs are drilled at the base with a tommy hole to facilitate adjustment and to hold the stud in position while its fixing-screw is being tightened. The upper stud is fitted with a knurled, retaining plunger so that this gear wheel can be readily removed in order to avoid the gear train rotating when not in use.

The 20-T. mandrel gear wheel is driven by a peg engaging in the small belt pulley of the fine-feed gear already described, and the pinion is secured in place by means of a $\frac{7}{16}$ in. × 26 t.p.i. screw fitted to the tail-end of the hollow mandrel.

Both the standard gear quadrant and the screw-cutting quadrant are secured by tightening a single nut fitted to the stud fixed in the bed casting, and, for convenience of working, this nut is furnished with a lever handle which is pressed into place and carries a knurled finger-piece at its outer end. When this clamp-nut is slackened, the main quadrant will, by virtue of its weight, tend to rotate and throw the fine-feed gears out of mesh; to prevent this, an adjustable set-screw furnished with a lock-nut is fitted to the under side of the quadrant, as can be seen in Fig. 1. This screw also provides a ready means of accurately adjusting the meshing of the gear wheels forming the first stage of the fine-feed drive.

Working Conditions

Normally, the fine-feed gear is kept in use, and the screwcutting gear is put out of action by rotating its quadrant so as to disengage the lead-screw wheel.

To bring the screwcutting gear into use, the appropriate change wheel is attached to the lead-screw and the gears are meshed with the aid of a sheet-metal gauge inserted between the gear teeth; in addition, the fine-feed gear is disengaged by means of its control lever. Should the two sets of gearing be accidentally engaged at the same time, no harm will be done, as the screw-cutting gear will continue to drive, and the belt of the fine-feed gear will merely slip on the small driving pulley.

Illumination of Water Gauges by the Refraction of Light

by S. F. Weston

THE subject of the refraction of light is a fairly extensive one. The phenomenon is made use of in many directions, but in this short article, it is only proposed to briefly describe a few methods of its application to facilitate the reading of the water levels in steam boiler drums.

Whilst the methods may not be applicable to the small boilers used by model engineers, it may be of interest to know how it has been applied for that purpose to the large steam units in commercial and power-generating use.

FIG Nº1.

A beam of light consists of an infinite number of small rays, and for our purpose, one ray only will be considered.

A ray emitted from any source travels in a straight direction, provided the medium through which it travels remains unchanged. A ray of light may be shown diagramatically as two very slightly divergent lines (Fig. 1), but more simply by a straight line.

If a second medium is introduced then the path of the ray is interrupted and slightly diverged from the straight direction. A very simple experiment will plainly show this. If a perfectly straight rod is placed in a bowl of clear water (see Fig. 2) it will be noticed that the rod appears to bend at the surface of the water. The reason for this is that the rod lies in two different media, part of the rod being in air, and part submerged in water. This apparent bending is due to

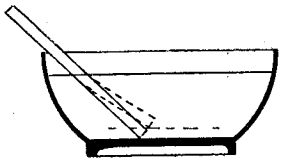


FIG Nº 2.

refraction at the surface of the water, as the refractive indices of air and water are different.

Consider another two media—air and glass. What happens is shown in Fig. 3. In this diagram the glass is shown very thick for the obvious reason of making the diagram clear. It must also be assumed that the surfaces of the glass are parallel.

It has been shown by experiment that the emitted ray in such an arrangement is parallel to the original or incident ray.

If the ray passes through four media, viz : air, glass, water, and back again to air, the resultant divergence from the original path is shown approximately in Fig. 4.

If a glass tube is half filled with water and a small rod or pencil held vertically against it and viewed as shown in Fig. 5, we see at once how the water-filled portion of the tube greatly magnifies the pencil or rod. The circular column of water acting as a strip lens.

Again, if a light is placed at the back of the water-filled tube the light rays will be similarly

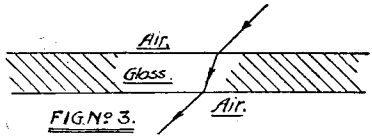


FIG.Nº 3.

magnified, as will be anticipated, and the water level clearly indicated.

This effect will be more strongly emphasized if an opaque screen is interposed between the lamp and the tube and a narrow open slot made in the screen. The upper part will show a narrow vertical strip of light, whilst the water space will be illuminated brightly for its whole width (Fig. 5).

This phenomenon is useful in indicating the height of the water in boiler gauge glasses. It can, however, be seen only when observed from the front ; this is a drawback, as it is often required to view the gauge glass from a side position. An inclined mirror is often fixed in front of the gauge, thus transmitting a view of the glass

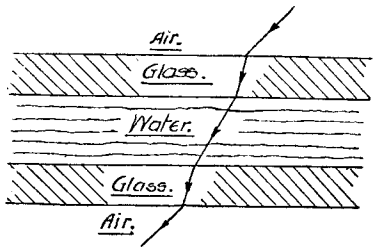


FIG Nº 4.

downwards to a second mirror fixed at the firing floor level, which shows a small image of the gauge.

A far better arrangement is that shown in Fig. 6 where instead of a slotted screen, as above described, a diffusing screen composed of opalite glass, together with red and green glass strips behind a protecting piece of ⅛ in. thick plate glass is used. By screening half the width of the tube and utilising the remaining half and magnifying this portion by means of a strip convex lens, the steam space in the tube is shown red and the water-filled part of the glass shows green.

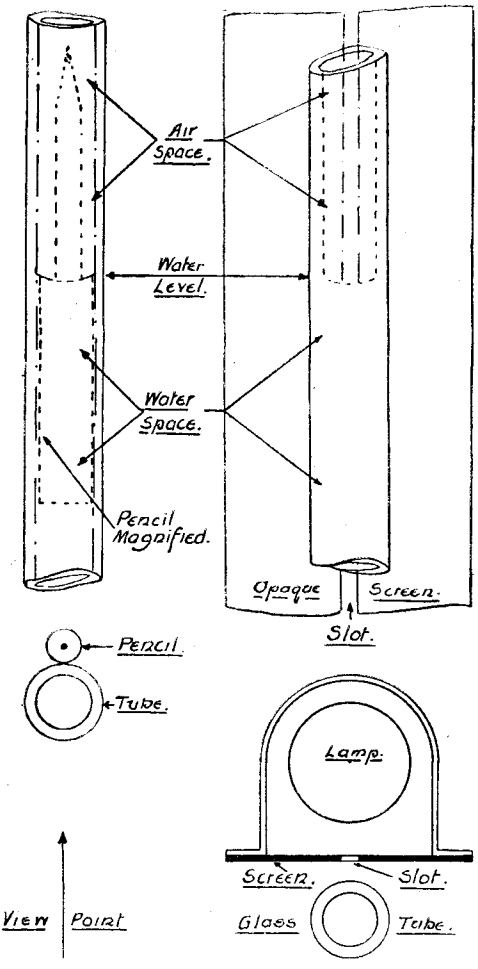


FIG Nº 5.

In boilers of the present day, high pressure is mostly the rule, and gauge glass tubes are not strong enough to withstand the pressure. There are many types of patented fittings on the market, many very ingenious.

One type may be described and this is shown in plan view in Fig. No. 7. It consists of a heavy steel forging machined to accommodate two pieces of toughened plate glass which form windows by which the water level is observed. The inner faces of the plate glasses are protected against the erosion of the water by strips of clear mica. Asbestos and aluminium joint rings are compressed against the glass by means of two holding plates and a series of bolts around the fitting. It will be noted that the glasses are so arranged that the water space is prismatic. This

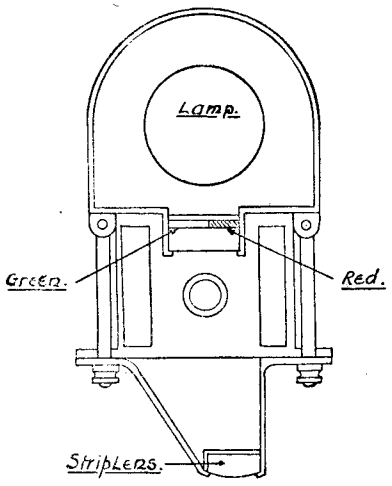


FIG Nº 6.

has the effect of refracting the ray passing through the water space in a different direction to that passing through the steam space. Such a fitting used with a two colour screen somewhat similar to that already described, and having the source of light projected by reflecting mirrors on to a strip lens at the rear of the fitting is most satisfactory. By means of mirrors and magnifying lenses the brilliant image thus obtained is brought down to the firing level, full size. This is a great advantage, as with modern steam units of to-day the steam and water drum of the boiler is sometimes a hundred feet or more above the operating level, and the intervening space filled with auxiliary plant.

It will be observed that the fittings described show the actual water level of the drum or a direct reflection of same in a mirror.

As the evaporation of the modern boiler is extremely rapid, the correct and reliable indication of the true water level in the boiler drum is of vital importance to the operating engineers.

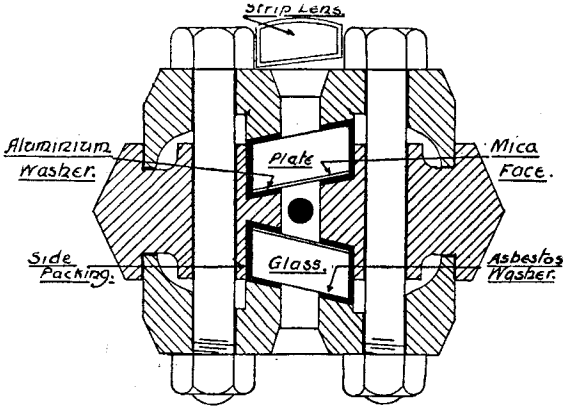


FIG Nº 7.

PRACTICAL LETTERS

Twist Drill Grinding

DEAR SIR,—Referring to the letter by Mr. S. W. Carr in THE MODEL ENGINEER of 8th March last on this subject, in the 27th October, 1927 issue of THE MODEL ENGINEER, Colonel H. S. King describes what he calls a Twist Drill Grinding Attachment for a 3½-in. Drummond lathe. This attachment is based on the design given by Mr. L. A. van Rooyen in THE MODEL ENGINEER of the 14th August, 1913, and mentioned by Mr. Carr. Using the descriptive matter and instructions contained in both the above articles I have made a grinding jig for twist drills which has been fitted to a van Dorn electric grinder. Although this instrument is quite successful, it is by no means simple to use, great care has to be taken with each drill to get results.

If Mr. Carr has access to THE MODEL ENGINEER containing Colonel King's article he will find suitable drawings to scale and photographs which should enable him to complete his attachment satisfactorily. If carefully made, it will repay the time and trouble anyone may feel inclined to spend on making it.

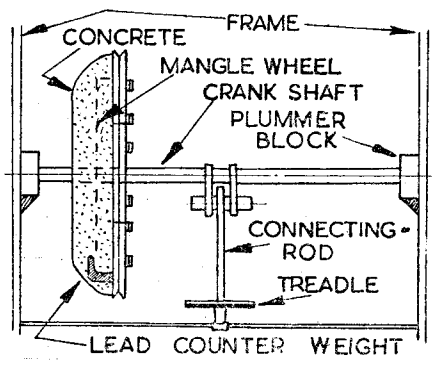
Yours faithfully,

Salisbury, Rhodesia. F. KRIENKE

"One Man Power Workshop"

DEAR SIR,—With reference to the above article in the January 18th issue, I should like to say I was in a similar position before enlistment in H.M.F.

I used an old-fashioned mangle wheel. Into the rim of this, from the side, I tapped six ⅜ in. B.S.F. holes. Three pieces of 6 in. × 1 in. × 18 in. beech were then obtained and bolted to the side of the wheel and cut roughly round by saw and chisel.



The next job was the crankshaft and treadle. The treadle followed much the same design as Mr. Lightwood's. The central hole in the wheel was ¾ in., so ¾ in. mild-steel bar was used for the crankshaft. The webs of which were made from mild-steel bar, ¾ in. × 2 in. × 3½ in., were machined on a friend's lathe. Both being clamped together during this operation, which was the boring of two holes ¾ in. diameter, 1½ in. apart, a tight fit on the bar.

Webs were then placed 2 in. apart on the centre of a bar 2 ft. long. The crank-pin was then pushed through the lower holes in the webs. I did not cut the centre piece out of the crank-shaft until the whole had been welded up. This ensured alignment of bearing surfaces. Which was two plumber blocks attached to the frames of the lathe stand.

The wheel was next keyed on to the shaft. Before doing this though, it was quite obvious I needed more weight on the wheel. My method was to cast concrete on to the back of it. A number of screws were first put in and left projecting a ½ in., wire was then interlaced from screw to screw. This was to bind the concrete. I found it quite easy to form a nice curve without the aid of moulds, etc.

The whole was then assembled in the stand. With my friend supplying power to the treadle and the aid of a very temporary toolrest, I was able to finish the wooden rim and cut the groove for the belt.

This foot motor has since done some very heavy work. Without undue exertion it supplies enough power for my 3½-in. Drummond lathe, which is the old type with the central leadscrew. One job was an 8 in. faceplate for same.

Yours faithfully,

R.E.M.E., Austria. W. J. PARLEY.

Utility Petrol Engines

DEAR SIR,—It was with great interest that I read the first article of Mr. E. T. Westbury's new series on a 50 c.c. auxiliary engine. Particularly pleasing were the remarks that he has been working on the designs for two or three small power engines suitable for driving in the workshop, etc.

During 1943, Mr. Westbury made some comments in the letter columns of THE MODEL ENGINEER to the effect that he had committed a few details of such an engine to paper, but so far it has, unfortunately, not appeared, although I still live in hope!

Efficiency faddists, no doubt, will maintain that individual electric motors are the ideal method of drive for the small workshop, and I agree with them. But as model engineers we are in the happy position of being able to have *what we like* and not *what is considered good for us*, and who can deny that half the joy of model engineering is in being "Gaffer" of one's very own engineering shop, together with tending the workshop engine.

What sort of engine would I like? Well, I am no i.c. expert (I bow to E.T.W. in that respect), but I fancy a water-cooled vertical, giving about ¾ h.p. at, say, 600 r.p.m., either two- or four-stroke, having no frills, simple to build with the average workshop equipment, and capable of running "till the cows come home."

It must, however, look like a real workshop

engine, perhaps even a little bit old-fashioned, to satisfy my likes! And don't forget plenty of oil-cups for me to fill, and bits of brass and steel to polish. A nuisance? Not a bit of it; I should love looking after such a workshop pal.

Yours faithfully,

Bristol. ANDREW SMITH. M.Coll.H., A.M.I.E.D.

Compressors for Refrigerators

DEAR SIR,—Since reading Mr. A. D. Dumis letter in the March 8th issue, I have come across some information on this subject which disagrees with his, although apparently, from an unimpeachable source.

I quote from "Refrigeration and Air Conditioning" by R. C. Jordan and G. B. Priester (Constable & Co., 30s.) published in 1949, and which deals with the whole subject of refrigeration from A to Z.

Corrosive Properties of Refrigerants

Ammonia—Pure anhydrous ammonia will dissolve copper unless protected by an oil film. Galvanised or tinned surfaces sometimes affected.

CO_2—Corrosive to iron or copper when both moisture and oxygen are present.

Freon Group—Not corrosive to any metals commonly used.

Methyl Chloride—Corrosive to zinc, aluminium and magnesium alloys in presence of small amounts of water.

SO_2—Corrosive to most metals when water is present. Moisture content must not exceed 50 parts per million.

Yours faithfully,

Wembley. W. H. RIDER.

Camera Construction

DEAR SIR,—I have read with interest, the letters appearing in the "Practical Letters" columns, concerning the construction of cameras, but have not ventured hitherto, to offer advice in the face of the detailed and interesting letters on the subject which have already appeared.

I do feel, however, that Mr. Donald McNarry's problem is one which my many years experience of rigging up cameras of all sorts might assist with.

Provided it is only intended to photograph inanimate objects, the camera may be of the simplest design, and the lens need really be of the cheapest. There are but three important rules to be followed in order to obtain the crisp pictures so desirable for subsequent reproduction viz., extremely accurate focus, correct exposure, and adequate lighting.

The actual camera body can be of any design, to provide a firm base, a front lens mounting, fitted with a rack and pinion movement (obtainable from Bonds O' Euston Road), a camera back with ground glass screen, a plate holder and bellows for connecting front and back of the camera.

Bellows can be made quite easily (I use blind cloth suitably blacked), and the whole apparatus is well within the scope of what Mr. McNarry inadequately describes as a "Mere Woodworker." The plateholder is perhaps the most difficult item to produce, and frankly I have never had to make one, as I have been able to pick up all kinds and sizes very cheaply from time to time, but I should certainly not hesitate to make them if need should arise.

The all-important question of the lens becomes no problem for the photographer of inanimate objects, as length of exposure does not matter, and a lens of F8 is all that is required. It might be as well to pay a few shillings more for a "R.R.", but it is hardly even necessary to pay the high price of an anastigmat of large aperture.

Shutters have also been discussed in your columns, but here again, they are not necessary at all, in fact I regard them as a nuisance, unless exposures of less than 1 sec. are contemplated, and for the work under discussion this is never required. I use a simple lens cap.

I should be most happy to give fuller details if requested, and I can assure Mr. McNarry that the cost of making cameras for the work he intends to carry out really is low enough to be counted in shillings rather than pounds, and I have done work with similar apparatus ranging from microscope photography to three colour litho work, using plates 15 in. × 12 in. for the latter.

Yours faithfully,

Harlow. ALLAN J. KEMP.

DEAR SIR,—I have read with interest the correspondence in your excellent journal relating to photography of model engineer's handiwork and allied subjects.

Perhaps some of your other readers are in the same happy position as myself and will support my views. Not only am I an enthusiastic model engineer, but I am also president of our local photographic society, and even with the facilities at my disposal I would not consider building a camera for model photography. Let us consider, say, ¼ plate size which is, I think, the best as it allows a full 2½ in. × 3¼ in. format to be used in the middle of the field. Single metal dark slides are going to cost the builder 10s. 11d. each; they are not the sort of thing to make with amateur workshop facilities. Material will cost, say, £2, and a lens, whatever one likes to pay. It will all total up to quite a tidy sum, and unless one is familiar with photographic principles the result may be disappointing.

My advice is twofold. If such model engineers as are interested would contact the local photographic society or camera club they would be welcomed with open arms and not only put on the right road and given every assistance, but would have plenty of orders for making the odd "one-off" job. Secondly, I am convinced after many trials, that the only suitable camera for the work in question is a view camera and the more movements the better, once they are understood and appreciated. For such work I use a ½ plate field camera, focussing back, swing and tilt back, rising front and turntable tripod head. The double bookform dark slides are adapted for ¼ plate or 2½ in. × 3½ in. alternatively. The lens is an astigmat of 7.2 in. focal length, which I often change for a Ross symmetrical of 16 in. focal length. The advantages are that with such long focal length lenses I can get large images on the plates at distances large enough

from my subject to avoid distortion. Also, at such relatively short distances, I consider the symmetrical type of lens to be superior when well stopped down to f. 64 or even f. 128.

I would also like to point out that the above equipment, including the ash tripod, shutter and leather case was not expensive. It cost £2 secondhand and the same thing can be bought repeatedly all over the country if a careful watch is kept on "junk shops" and such like. Very often the local camera club could help, and I would like to see greater co-operation between model engineering and photographic societies, because it would be to such mutual advantage.

Yours faithfully,

Birmingham. M. R. T. SCOTT.

CLUB ANNOUNCEMENTS

Society of Model and Experimental Engineers

The next meeting of the society will take place at the Caxton Hall, Westminster, on Thursday, May 24th, 1951, at 7 p.m. The subject will be a talk by Mr. E. W. Fraser entitled "Looking Backwards." Members who remember Mr. Fraser's previous talks need no reminder of the lecturer's ability to recount his experiences in a witty and intresting manner, and it is hoped that a large number of members will attend. Visitors and members of affiliated societies will be cordially welcomed, and forms of application to join the society may be obtained from the Hon. Secretary, A. B. STORRAR, 67, Station Road, West Wickham, Kent.

The Model Engineers' Society

Our forthcoming exhibition will be held in the Y.M.C.A., Wellington Hall, Belfast, from May 28th until June 2nd inclusive.

This is our third public exhibition and is to be more ambitious than previous ones, being another inter-club effort. Work is going ahead on the outdoor track in Waterworks Grounds, Antrim Road, Belfast.

Hon. Secretary: H. G. CALDWELL, A.M.Inst.B.E., 35, Torr Way, Finaghy, Belfast.

Altrincham Model Power Boat and Car Club

The above club will hold its annual regatta on Saturday, May 26th, in Stamford Park, Altrincham.

The regatta will commence at 2.30 p.m. prompt, and the following events will be run:—

500 yds. Class "A" hydroplanes for "Makin" Cup and prizes.

500 yds. Class "B" hydroplanes. Silver cup and prizes.

Steering competition for silver cup and prizes.

500 yds. Class "C" and "C" restricted hydroplanes. Silver cup and prizes.

Silencers must be fitted.

This regatta is being run in conjunction with the Festival of Britain celebrations in Altrincham and it would be appreciated if as many competitors as possible would attend. Should the event be as great an attraction as those held in Stamford Park before the use of the water was banned in 1938, there are distinct possibilities that the Altrincham Council will assist the club to become established in Altrincham.

Stamford Park is close to Altrincham railway and 'bus stations and refreshments will be obtainable. Further particulars from the secretary, who would appreciate a post card from intending competitors stating events they wish to enter.

Hon. Secretary: D. INNES, 122, Downham Crescent, Prestwich, Lancs.

The Tyneside Society of Model and Experimental Engineers

The next meeting will be held on June 2nd. A talk will be given by Mr. Jones, of the Northern Gas Board, on "Industrial Gas Burners," in the headquarters of the Newcastle Photographic Society, 6, Rutherford Street, Newcastle-upon-Tyne, at 2.45 p.m.

The "Maskelyne Lecture"—"Tractor's Don't Eat on Sundays" by Professor McEwen, of Durham University, was a great success and as humorous as the title suggested.

Hon. Secretary: L. JAMIESON, 34, Dorcas Avenue, Pendower, Newcastle-upon-Tyne, 5.

Bromley Miniature Power Boat Club

Our first regatta was held at the Boating Pool, Whitehall Recreation Ground, Bromley, on Sunday, April 29th. It was opened by the Mayor of Bromley, Alderman J. S. Marriot; the Mayoress was also present.

The Mayor, in his speech, laid stress on the value of our hobby as a relaxation from everyday work, and greatly admired the craft present. He then operated Mr. R. Curmen's radio-controlled boat, *Clouis*, and put up a very good show, after trying to demolish the boundary wall of the pond!

We apologise to members of other clubs for not making it clear that it was a club regatta; it is hoped to hold an "open" later in the year, but we may have to restrict it to free running and radio-controlled boats as, owing to our very strict silencing rules, we find that some hydroplanes from other clubs are too noisy for our locality.

Hon. Secretary: G. O. CAIRD, 26, Blackbrook Lane, Bickley, Kent.

City of Leeds Society of Model and Experimental Engineers

Future activities of the above society are as follows:—

Friday, May 18th. Visit to the Keighley Society.

Wednesday, May 23rd. Working meeting at Mr. Cook's, Kidacre Street.

May 23rd to 26th. Spenborough Society's exhibition at Town Hall, Cleckheaton.

Tuesday, June 5th. Ordinary meeting at Salem Church Institute.

Saturday, June 30th. Track meeting at Clayton firms sports day, Dartmouth Ground, Burton Road (of Dewsbury Road), Leeds, 11.

Saturday, July 14th. Our own track day at Mr. Donald's field at Garforth Bridge, Garforth.

Saturdays, July 21st and 28th. Track meetings at Knottingley.

Hon. Secretary: R. G. COLBRAN, 9, Church Wood Avenue, Headingley, Leeds, 6.

St. Albans and District Model Engineering Society

We have just concluded our third year as a society and we celebrated the occasion with a dinner and entertainment at the Waterend Barn; our guests included the Mayor and Mayoress and representatives of our neighbouring societies.

In the past year we have laid a 3½-in. gauge locomotive track and acquired a large workshop which we are equipping with a lathe, drilling machine and other tools.

We are busy building boats for our first regatta which is being held in conjunction with the North London Society on Sunday, July 15th.

Our local council has been very helpful in assisting us to hold the first power boat regatta in St Albans; the lake is at present being cleaned out, so we look forward to some good running free from weeds.

We believe that we can claim to be the only model engineering society in England with a lady president who is also an active model engineer.

Our membership is steadily increasing; meetings are held on the second Wednesday of each month at Thrales Cafe, in the Market Place, and the last Wednesday of each month at the Glen Almond Workshop, King Harry Lane. Visitors are welcome to all our meetings.

Hon. Secretary: L. G. CURTIS, 2, Grange Gardens, St. Albans.

Ickenham and District Society of Model Engineers

Recent activities of the society included a visit to Amersham to examine some very fine road locomotives which were being prepared for the ploughing season.

A very interesting series of club evenings have been held; Mr. Westbury's recent illustrated talk on "Model Power Boats" was a highlight in the programme.

Preparations are in hand to make the forthcoming annual exhibition on June 16th a memorable one. The society's "OO"-gauge track is nearing completion and the 3½-in. and 5-in. portable track is being overhauled preparatory to the show.

May 18th will see our annual auction sale which is deservedly popular, and should be even more so in these days of rising prices and shortage in materials.

The society welcomes anyone interested in the craft of model engineering and caters for every taste. Meetings are held every Friday at 7.30 p.m. at the Memorial Hall, Ickenham (opposite the "Fox and Geese"). Prospective members should contact the Hon. Secretary, A. F. DUNN, 27, Ivyhouse Road, Ickenham, Uxbridge.